REPORT RESUMES

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THE CHANGING ROLE OF THE AUDIOVISUAL PROCESS IN EDUCATION--A DEFINITION AND A GLOSSARY OF RELATED TERMS.

BY- ELY, DONALD P.

NATIONAL EDUCATION ASSN., WASHINGTON, D.C.

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A DEFINITION OF THE BROADER FIELD OF INSTRUCTIONAL TECHNOLOGY WHICH INCORPORATES CERTAIN ASPECTS OF THE ESTABLISHED AUDIOVISUAL FIELD IS PRESENTED. THE NEED FOR DEFINITION IS DISCUSSED, WITH A REVIEW OF DEVELOPMENTS IN THE AUDIOVISUAL FIELD OVER THE PAST 30 YEARS. THE LARGER PART OF THE DOCUMENT IS A GLOSSARY OF APPROXIMATELY 900 WIDELY USED TERMS RELATING TO INSTRUCTIONAL TECHNOLOGY. TERMS ARE LISTED BOTH ALPHABETICALLY AND BY SUBJECT AREAS. (MS)

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headquarters:

LOS ANGELES FACILITY
School of Education
University of Southern California
Los Angeles 7, California

WASHINGTON FACILITY
National Education Association
1201 Sixteenth Street, N. W.
Washington 6, D. C.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Monograph No. 1

The Changing Role of the Audiovisual Process in Education: A Definition and a Glossary of Related Terms

edited by

Donald P. Ely

and prepared by

The Commission on Definition and Terminology

Henry A. Bern
Samuel Cohen
James Q. Knowlton
Susan M. Markle
Sidney Eboch

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School of Education
University of Southern California
Los Angeles, California
Mailing address: 924 West Thirty-Seventh Street
Los Angeles 7, California

The Washington Office of the Project is located in the

National Education Association
1201 Sixteenth Street, N.W.
Washington 6, D.C.

Principal Investigator: James D. Finn (Los Angeles)
Consulting Investigator: Donald P. Ely (Syracuse)

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PROJECT ADVISORY COMMITTEE

Chester D. Babcock
State Department of Public Instruction
Olympia, Washington

Richard D. Batchelder
Newton High School
Newton, Massachusetts

Lester F. Beck
Los Angeles, California

James W. Bushong
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Charles F. Hoban
University of Pennsylvania
Philadelphia, Pennsylvania

Anna L. Hyer
Department of Audio-Visual Instruction
National Education Association
Washington, D.C.

Philip Lewis
Board of Education
City of Chicago
Chicago, Illinois

A. A. Lumsdaine
University of California
Los Angeles, California

EX-OFFICIO MEMBERS

Seth Spaulding
U.S. Office of Education

L. G. Derthick
National Education Association

PROJECT STAFF

James D. Finn

Lee E. Campion (October 1960 to October 1962)
Clarice Kelley
Desmond P. Wedberg (January to September 1962)
May Ellen Looper

Donald P. Ely
Donald G. Perrin
Ronald J. McBeath (July to November 1961)
Carole Prenter (Summer 1961, 1962)

Lt. Col. John T. Quick, Military Consultant

PREFACE

Definition

The increasing use of the audiovisual label over the last thirty years has created a term with varied meanings. The audiovisual field has been "defined" by listing machines, by listing sensory experiences or by indicating what audiovisual is not, i.e., whatever is verbal. As newer developments in technology have been applied to the problems of education, the audiovisual label has become less useful to describe the field with accuracy. A call for unity and direction has come from many sources within and without the audiovisual field. This monograph attempts to define the broader field of instructional technology which incorporates certain aspects of the established audiovisual field.

The task of defining a field is difficult. No one definition may be considered as the final definition. It is a reference point which may serve as a stimulus for further discussion and re-definition. If it is used to promote rigorous discussion among the personnel within the field, it will have served its purpose.

Chapter I presents the climate which has given rise to the need for definition. In Chapter II the developments of the audiovisual field during the past thirty years are reviewed as a backdrop for the definition. A definition is stated in Chapter III. The rationale supporting the definition is outlined with particular reference to contributions from communication theory and learning theory. Models are used as reference points. Chapter IV applies the definition to the functions of personnel within the field, suggesting certain realignments based on new insights and directions derived from the definition.

Terminology

The undefined boundaries of the audiovisual field have been further complicated by the use of terms coined at random by manufacturers of devices and producers of materials. Many terms were accepted regionally or within a specialized segment of the field. A universe of discourse is impossible with a diversity of terms and multiple definitions. This monograph attempts to bring together and define the most widely used terms relating to instructional technology.

The definitions of approximately 900 key terms were selected from over 2,000 terms reviewed for possible inclusion. The criterion of utility was more important in the selection of terms than comprehensiveness. Terms in current usage were analyzed and reviewed by members of the Commission and the Advisory Committee of the Technological Development Project. The major objective of this section is to define each term so that unity might be achieved. This terminology should serve as a reference for all writers and speakers who communicate information about technology in education.

The Commission

The Technological Development Project of the National Education Association was supported by the United States Office of Education. It offered an opportunity to define the field and its related terminology. The Commission on Definition and Terminology was established to analyze the problem and to offer to the field a publication which would serve as a reference point for further discussion.

Donald P. Ely, Director of the Audiovisual Center at Syracuse University served as Chairman of the Commission and Editor of this monograph. Members of the Commission included:

Henry A. Bern, Research Associate, Audiovisual Center, Indiana University

Samuel Cohen, Administrative Assistant, Hewlett-Woodmere Public Schools, Hewlett, New York

Sidney C. Eboch, Research Associate, Technological Development Project

James Q. Knowlton, Assistant in Research, Indiana University

Susan M. Markle, Research Associate, School of Education, University of California at Los Angeles. (Dr. Markle was associated with the Center for Programed Instruction in New York while serving on the Commission.)

Consultants to the project included:

Lee E. Campion, Director of Educational Communications, State Education Department, Albany, New York. (Mr. Campion was formerly Associate Investigator in the Technological Development Project.)

Edgar Dale, Professor of Education, Ohio State University

James D. Finn, Professor of Education, University of Southern California. (Dr. Finn is Principal Investigator for the Technological Development Project.)

George Gerbner, Research Associate Professor of Communications, University of Illinois

A. W. Vander Meer, Dean, College of Education, Pennsylvania State University

Research Associates at Syracuse University were Richard Michael and Don A. Nolder.

All Commission members have contributed to the content of this document but the Editor assumes responsibility for the final product. Dr. Cohen prepared the draft for Chapter I, Dr. Bern authored Chapter II. Chapter III is a composite of the Commission's work but the portion dealing with communication and learning models, as well as the development of the audiovisual model, is the work of Dr. Sidney C. Eboch. Chapter IV amalgamates ideas from Dr. Eboch, Dr. Charles F. Hoban, Jr., Dr. Cohen and other Commission members.

The comprehensive list of definitions for the teaching machines and programed instruction of the terminology section was written by Dr. Markle. Don A. Nolder compiled all the terms.

The editor is particularly indebted to intellectual contributions of the Commission members without whom this monograph could not have been written. A major contribution was made by Dr. Sidney C. Eboch who submitted major ideas regarding definition. Don A. Nolder, Research Assistant, collected and reviewed all terms which were potential entries for the terminology. And finally, to Mrs. Winifred Buck, secretary to the editor and typist for the final draft, goes an expression of gratitude for the patience, understanding and professional competency to finish a monumental task.

Donald P. Ely

Syracuse, New York
January 1, 1963

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PART I

DEFINITION

CHAPTER I

INTRODUCTION

Teaching and learning are among the most difficult and complex processes to be found in our society. This is becoming more widely recognized and understood as a result of the extensive examination of American education during the past decade. Through the mass media of communication, public attention has been focused upon the written and spoken statements of educators, supporters and apologists for the schools, and the constructive and destructive critics of education. It is becoming more and more apparent that the difficulties and complexities of teaching and learning have been intensified by rapid and drastic changes in man's knowledge, in the world of international relationships, in the fabric of American society, in the pattern of technological developments, and in education itself. These changes have at the same time made education more essential to our survival and progress. As a result, there is increasing awareness of the need for greater support of, and improvement in, American education.

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Within the field of education there is increasing need for a definitive statement describing the emerging technology of instruction. School administrators see an increasing need for unity and integration of technological developments in providing assistance to teachers and students. The roles and functions of various specialists on the teaching and administrative staff are in the process of clarification. Many of the specialists themselves see a need for this, as is apparent in the recent cooperative efforts of different departments of the National Education Association. Teachers who are trying to improve instruction through the best utilization of a wide variety of instructional materials are requesting better procedures for providing them with those materials.

Audiovisual specialists (the first technologists of the profession) are divided regarding the scope of their responsibilities and uncertain about the major direction for future developments. They are engaged in a self-analysis of their current status. The differences in status, philosophy, practice and insight among audiovisual specialists cannot be resolved by attempting to achieve agreement on a new title to replace that of audiovisual director.

A satisfactory definition of the field of instructional technology will allow for finding common ground, propose tomorrow's horizons and allow for a variety of patterns for specific individuals to follow in specific institutions within the single field. Research must be designed in terms of a clear understanding of the field of instructional technology. Superintendents of schools are requesting criteria for new personnel needed for various phases of instructional improvement. Teacher-education institutions need assistance in planning courses for pre-service and in-service instruction that will provide the skills and understandings which will be required in tomorrow's classrooms.

Specialists in communication, psychology, audiovisual instruction, curriculum and allied areas are, from various points of view, approaching a new concept of the field growing out of the increasing application of technology to education. In recent years terms like instructional materials, instructional resources, audiovisual communications, educational technology, audiovisual engineering, instructional communications systems, etc., have appeared. In general, these labels involve ways of achieving better learning through the utilization of all media and techniques of communication in an organized or systematized manner. The impact of technological developments such as television, teaching machines, language laboratories, computers, data storage and retrieval equipment, 8mm sound film and overhead projection is involved in this pattern of thought.

The unique contributions of each of these and all other methods of communication must be organized into systems of instructional resources and procedures in order to secure more effective and efficient learning. This will radically change the role of the teacher and will require a team of specialists working together to provide resources and instructional guidance for teachers and students. As this role changes we must guard against the serious danger of dehumanization of instruction. Robert Wagner has said, "The application of the technological systems concept alone, however, is not likely to solve the whole problem unless more is also heard of the art of teaching, and about what might be called design in education--that is, the thoughtful, artful, organic application and creative control of system."[1]

This report aims to provide a working definition for the field of instructional technology which will serve as a framework for future developments and lead to an improvement of instruction. School plant, program, personnel, materials and equipment must furnish an educational environment that is cohesive, complementary, unified and that stimulates and encourages learning.

---

[1] Robert W. Wagner, "Design in Education," Newsletter (October, 1961), p. 1.

CHAPTER II

HISTORICAL PERSPECTIVES

If there is a single term that describes the basis of the present concern for definition of the audiovisual field as it expands into a greater, more inclusive technology of instruction, it is "rate of growth." The rate of growth of certain aspects of audiovisual communications and related fields threatens to outstrip the capacity for adjustment of the field to the resulting new boundaries, new universes of discourse and new challenges. In the following sections this rate of growth will be described by contrasting recent developments with a 1930 reference point. D-6

This analysis must begin with a consideration of the audiovisual field since the initial developments in the technology of instruction were largely concentrated in the audiovisual field. Audiovisual personnel were the first technologists in education.

A. *Growth of Audiovisual Education*

Professional Organizations.--Although the field of instructional technology has origins traceable to prehistoric times, for our immediate purposes we can begin with the 1930's. In 1930 there were three major organizations in the audiovisual field:[1] The Visual Instruction Association of America, the National Academy of Visual Instruction and the Department of Visual Instruction of the National Educational Association. In February 1932 the three groups merged, the emerging organization retaining the title, "Department of Visual Instruction of the National Education Association." The total membership at this time was about 300.

---

[1] For material in this section we are indebted primarily to F. Dean McCluskey, "The Depression Years of the 1930's and Audiovisual Education," *AVISO* (1950), pp. 18-25.

Following the merger, numerous local groups affiliated themselves with the Department. The Visual Instruction Association of America which had its headquarters in New York City, for example, became the metropolitan New York branch of the Department of Visual Instruction of the National Education Association. Soon, groups in New Jersey, Massachusetts, Southern California, Pennsylvania and in other centers throughout the nation became affiliated.

After World War II the National Education Association established the Department of Audio-Visual Instruction with an executive secretary and a full-time staff. Between 1948 and 1950, DAVI was reorganized with a new committee structure and increased professional activity.

Within the past five years the membership has increased from 3,000 to over 5,000. The department now publishes two journals, Audiovisual Instruction and Audio Visual Communication Review which have become the professional journals for all personnel in the field.

Parallel developments in the broadcasting field occurred with radio education emphasis prior to 1941 and educational television growth after World War II.

Professional Education.--Professional education was an immediate and important concern of the newly merged Department of Visual Instruction of 1932. The first president of the Department, Charles F. Hoban, Sr., was then Director of the Pennsylvania State Library and Museum and Director of Visual Education for Pennsylvania. Setting the example in his own state, he pushed for certification requirements and succeeded in getting the Pennsylvania State Council of Education to adopt the following resolution in 1934:

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> Resolved that all applicants for permanent teaching certificates on and after September 1, 1935 shall be required to present evidence of having completed an approved course in visual and sensory techniques.

Today more than sixty institutions and thirty states are offering a minimum of one graduate course in each of three areas, "utilization," "production," and "administration," as recommended by the Department of Audio-Visual Instruction (12). Perhaps a more noteworthy index of growth in professional training is the development of programs leading to the doctorate degree in a number of leading universities (5). For example, one may earn a doctorate with audiovisual specialization at Columbia University, Indiana University, Michigan State University, New York University, Ohio State University, University of Southern California, and Syracuse University.

Professional Province.--In the 1930's and even as late as the 1940's, when the Department of Visual Education added "audio" to its province and to its official title, the matter of specifying professional boundary lines did not loom as a serious issue. As the membership grew, however, its widespread activities brought it into close contact with other fields--journalism, radio and television, library, etc. Occasionally, contact meant conflict. This occurred in 1956 when a new journal called *Instructional Materials* was established by the Department of Audio-Visual Instruction. D-9 It was a step forward in the professionalization of the field and an extension of its horizons.

Congratulations received from organizations such as the Department of Elementary School Principals, American Library Association, American Association of School Administrators, etc., were published in the first issue. In the very next issue, however, the new horizons were beclouded with discussions concerning the implications of the title, and within six months, the title had been changed to *Audiovisual Instruction*. It appeared to some, at that time, that loss of the term "Audio-Visual" indicated a redefinition of the field which threatened the organizational (and perhaps economic) integrity of the membership.

More recently, suggestions have been made that the audiovisual specialist redefine his role in terms of "learning technology" (6), "instructional communication-systems engineering" (1), "technology of education" (10), etc. But there are other growing professional groups working toward similar redefinitions. A group of psychologists, for example, has recently founded its own professional periodical to foster the growth of a new field, the "true technology of education," which it has labelled "Mathetics" (9).

Professional issues are, of course, much deeper than discussions about words appearing as titles of periodicals. Clarification of these deeper issues cannot be long ignored. Examination of some of these issues are involved in the present undertaking. D-10

B. Growth of Communications

The growth of audiovisual education was, of course, not an isolated phenomenon. It was an aspect of change in society as a whole, and particularly in the academic world. According to Lasswell, "No change in the academic world has been more characteristic of the age than the discovery of communications as a field of research teaching and professional employment" (13, p. 245). A convenient reference point for the growth of the field is the appointment of an interdisciplinary committee by the Social Science Research Council in 1931.

For some time thereafter political scientists led the way in communication studies. Gradually such studies were undertaken by schools of journalism, business and education. Different communication frameworks developed: the institutional-historical, represented by Frank Luther Mott and David Riesman; the sample survey, represented by Paul Lazarsfeld; the experimental-psychological, represented by Carl Hovland; the small-group analysis represented by Kurt Lewin, etc. (4). In 1953, by incorporating the term "communication" into the title of its newly established journal, AV Communication Review, the audiovisual field clearly recognized the spirit of the times and joined the communications field in yet another framework.

But how is audiovisual communications to be distinguished from the others? On the basis of such historical roots as paleolithic paintings, the text-book illustrations of Comenius, professional emphasis on visual stimuli (as reflected in the names of the 1932 merging associations), a concern with pictorial or graphic communication had often been claimed as the distinctive characteristic. As late as 1957, this characteristic was accorded special treatment in the form of a supplement of the AV Communication Review entitled "Graphic Communications and the Crisis in Education" (15).

In the past five years, however, a broader approach has been developing. It is based upon a concern with the "machine" and "systems" and "management of learning" rather than with graphic communication. Thus we find Hoban at a conference on "new media" concerned about the "limiting" aspects of older approaches. By recognizing the "machine" as the common characteristic of educational media, he says, we arrive at a broader more useful concept, the concept of an educational technology.

> When we consider the part machines[1] play in education, we are forced into a consideration of man-machines system. When we consider man-machine systems, we are forced into a consideration of technology. By a process of progressive forcing, we advance to the broader concept of educational technology or technology in education, as a central subject to which we must relate theories, research, and educational practice (10, p. 5) (emphasis added).

At the same conference, Bern related educational technology to a continuum of problems ranging from the molecular to the molar. At the molecular end of the continuum lie historically older problems such as the "difference" between the basic elements of media--word and picture. At the molar end lie the uncharted problems of education conceived within a "systems engineering" framework (2, p. 24).

In summary, the burgeoning of different frameworks within the "discipline" of communications and the broadening of perspectives within audiovisual communications calls for a clarification of the distinctive framework of the audiovisual field.

---

[1] The use of the word "machine" in this context may be interpreted as the technological "hardware" used in the classroom, e.g., projectors, recorders, programed learning devices and television equipment.

C. Growth in Theory

According to W. C. Meierhenry, learning theory as a basis for more effectively utilizing audiovisual materials has only recently been given any attention. He notes that "of the pertinent earlier work, Mark A. May has reported research as far back as 1946 on experimental motion pictures designed and produced to permit examination of certain psychological theories" (14). By implication then, from 1930 to 1946 was a period of little growth of theory-oriented research. D-13

Since then, however, increasingly frequent attempts have been made to go to theorists for research directions. Thus Smith and Van Ormer tried to formulate relationships between learning theory and Instructional Film Research in 1949 (17); T. S. Kendler and others sought to trace some of the implications of learning theory for the design of audiovisual materials in 1953 (11); James J. Gibson was called upon to try to frame a "theory" for audiovisual communications and produced "A Theory of Pictorial Perception" in 1954 (8); and in a special supplement of the AV Communication Review in 1957, Neal E. Miller presented "Scientific and

Research Implications Principles for Maximum Learning from Motion Pictures," based upon the Miller-Dollard "Drive," "Cue," "Response," "Reward," model (15).

The 1961 supplement of the *AV Communication Review* coming only four years after the Neal Miller supplement called upon other prominent psychologists to present learning theories as related to audiovisual utilization. Among the psychologists included, are: S. Luchins, H. H. Kendler, R. Glaser, L. Postman, J. Deese and F. J. McDonald.

As can be seen from the above, major efforts have focused on "learning" theory, reflecting, perhaps the traditional association of "learning" and "education." With the emergence of the communication framework there have been one D-14
or two attempts to relate to "communication theory" (7, p. 3). If the professional province of instructional technology is to include a concern for complex educational systems as has been indicated in the past several years, other sources of "theory" will be required. As Bern suggested, "For problems involving such systems we might better [call] upon persons in the area of operations research and systems engineering. From them we might [hear] about cueing theory, simulation techniques, linear programing, information theory, systems dynamics theory, etc. These have apparently already had some success in solving control and management problems of complex systems" (2, p. 6).

Despite the late start in 1946, audiovisual communications is both perceptive and energetic in its attempt to discover and support its theoretical foundations as the field develops wider horizons in the field of instructional technology. The present Commission is another aspect of this effort--one which seeks to examine past attempts and to bridge some definitional and terminological gaps arising from current developments.

D. Growth of Instructional Technology

Perhaps no aspect of the general growth we are describing presents a steeper slope, i.e., greater growth over a shorter period of time, than that of technological growth. In fact, it might be perceived that growth in this area, above all areas, is both the basic and proximate cause of our present task.

Even as Sputnik, only a few years ago, seemed to present to the world overnight, all of space as a realistic range for exploration, so language laboratories, television, teaching machines, and computers seem to present to the field of audiovisual communications overnight, all of instructional technology (within and without the field of education; national and international) as a realistic realm for exploration and systematization (3). Brochures of universities offering professional study in audiovisual communications do not hesitate to state,

> There is an increasing awareness of the need for improving techniques of communication in all areas of endeavor. Wherever persons are interested in modifying their own behavior or the behavior of others, the significant contribution of audiovisual materials in the communication process has become recognized . . .
>
> [And thus training is needed by] audiovisual communications specialists in administration, utilization, production, training, and research in agencies of government, religious organizations, farm and labor groups, business and industry, health and welfare agencies, and non-profit organizations and associations on local, state, national and international levels (18, p. 1).

No one has been more sensitive to the impact of technology upon education, in general, and upon audiovisual communications in particular than the past president of the DAVI, James D. Finn. Figure 1 below, presents the growth of instructional technology as he hypothesized it in 1959.

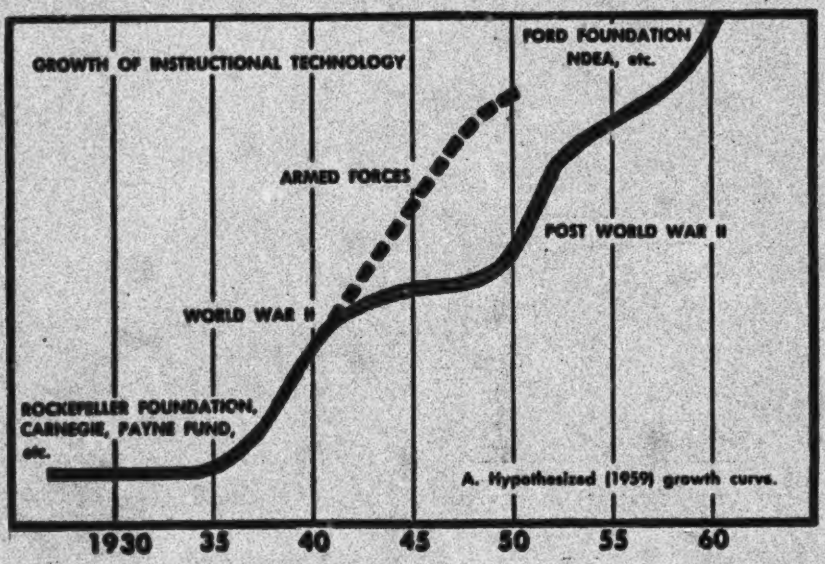

Fig. 1.--Growth of instructional technology.

Excerpting from his explanation of the figure, we can see that

> Figure 1 . . . covers very roughly, the last thirty years. . . . The development of instructional technology (the use of devices, materials and planned systems) was at a relatively low level from 1930 to

> 1935. Between 1935 and 1940 the movement took a great sweep upward due principally to the research and development funds poured into it by the Rockefeller Foundation and the Payne Fund of New York, the attention given to it by a group of very talented men and the availability of better materials and machines.
>
> As with all educational activities, a slow-down occurred in instructional technology during the war and a lack of equipment, materials and audiovisual personnel set back the movement within education--or, at least, caused it to mark time. However, this same technology of instruction, as everyone knows, moved over into the areas of industrial and military training during the war. This move relied principally on the previous findings of the educational research and development activities of the thirties and succeeded brilliantly by supplying the necessary money and talent for successful implementation.
>
> Following World War II, a great public (and some continuing military) interest developed in the use of audiovisual materials and, during most of the decade 1945-1955, another upsurge can be noticed as this technology was introduced into education with some force. Military sponsored research, principally at Pennsylvania State University, also continued.

D-17

> However, the curve of the post-war growth of instructional technology began to level out between 1950 and 1955. At the same time (circa 1952-1953) another infusion occurred. It began with money and pressure from the Ford Foundation which was later supplemented by the National Defense Act with its attention to the new media of instruction, the national concern with problems of quality and quantity in education, etc. The curve of growth took a sharp turn upward about 1955 and has been continuing almost straight up ever since as, in addition to other forces, inventions, advances in educational psychology, new concepts of educational methodology and other developments have all made themselves felt. . . . (19, pp. 54-55).

Universities have already established and more are in the process of establishing auditoria and "learning centers" capable of automated synchronized audiovisual presentations that are comprehensive in scope. A prominent audiovisual enterprise, Encyclopedia Britannica Films, Incorporated, has set up its own learning center, headed by a leading "mathematical learning" psychologist with facilities for doing research. The potential impact of television is perhaps exceeded by the latest products of technology: teaching machines, classroom communication systems and "simulation" laboratories based upon electronic computer facilities.

It is the responsibility of leaders to respond intelligently to technological change. In the case of teaching machines, leadership of Department of Audiovisual Instruction has made a strong bid for equal professional footing with the American Psychological Association. If the membership is to support the leadership in such bold steps, "definition and terminology" as a basis for direction of professional growth is a prime prerequisite.

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CHAPTER III

A DEFINITION

The unity of any profession depends upon the acceptance of certain basic concepts common to each member of that profession. Ideally, each person within a given field would accept, without reservation, a core definition of that field. This unanimity is seldom achieved in any profession or group.

The field of audiovisual communications, the largest single segment of the growing technology of instruction, has reached the point of definition-making and finds itself in the same quandary other fields have discovered when they have attempted to define the field, i.e., definition exists at various levels of understanding but no _one_ definition can be _the_ definition. This section presents a definition for the field of instructional technology--one which will allow persons concerned about the field, regardless of their background or their professional specialization to speak intelligently to one another.

Let us now look at the criteria for useful definitions. They should 1) clarify the description of the field in ordinary language; 2) summarize existing knowledge; 3) mediate applications of knowledge to new situations; and 4) lead to fruitful lines of experimental inquiry.[1] The definition presented here attempts to meet these criteria.

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[1] William K. Estes _et al._, _Modern Learning Theory_ (New York: Appleton-Century-Crofts, 1954), p. xv.

A. A Definition

> *Audiovisual Communications*[1] *is that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process.*
>
> It undertakes: 1) the study of the unique and relative strengths and weaknesses of both pictorial and nonrepresentational messages which may be employed in the learning process for any purpose; and 2) the structuring and systematizing of messages by men and instruments in an educational environment. (This includes the planning, production, selection, management and utilization of both components and entire instructional systems.)
>
> Its practical goal is the efficient utilization of every method and medium of communication which can contribute toward developing the full potential of the learner.

To understand the rationale supporting this definition it is necessary to reorient existing concepts which characterize the audiovisual field.

1. It will be necessary to use the *process* concept rather than the present product concept. The concept of *process* dictates

---

[1] The "audiovisual communications" label is used at this time as an expedient. Another designation may evolve which should then be substituted.

the relationship between events as dynamic and continuous with no specific beginning or end. All elements in a process interact with each element affecting all the others. The traditional product concept in the audiovisual field views the "things" of the field by identifying machines, use of particular senses, and characteristics of materials by degrees of abstractness and/or concreteness.

Both learning theory and communication theory, which have been identified in Chapter II as fields contributing to the development of audiovisual thinking are oriented to the process concept. Many of the contributions to the physical sciences in the twentieth century have resulted from the process framework. This has proven to be a fruitful approach to the advancement of knowledge.

2. Materials and machines are not useful distinctions in the field of instructional technology. Messages and media-instrumentation should replace materials and machines.

The ladder of abstraction concept, which historically has served as a "definition" of the audiovisual field, is not sufficiently flexible to include new media which may arise in the future. Materials and machines are interdependent elements. (A motion picture and the projector are inseparable as are all materials requiring machines for their use.)

The use of messages and media-instrumentation becomes more functional since content and form are treated separately. Message indicates the information to be transmitted--the content, the meaning. Media-instrumentation indicates the transmission systems (the materials and the devices) available for carrying the selected messages.

3. Learning theory and communication theory offer the basic concepts for a definition of the instructional technology field. Since instructional technology will adopt the process orientation, certain elements of learning theory and communication theory offer potential contributions to the definition, e.g., source, message, channel, receiver, effects, stimulus, organism, and response.

B. A Model

Deutsch defines a model as ". . . a structure of symbols and operating rules which is supposed to match a set of relevant points in an existing structure or process."[1] Models of the learning process and the communication process offer the basic elements for an audiovisual model. A comparison of learning and communication models will indicate a congruency which will be useful bases for an audiovisual model.

---

[1] K. W. Deutsch, "On Communication Models in the Social Sciences," Public Opinion Quarterly, XVI (Fall, 1952), 356-81.

A Model of Learning Theory.[1] --The basic minimum elements of learning theory are stimulus, organism, and response (Figure 1).

Stimuli are considered to be those elements of the environment which are specifically designed, controlled (insofar as possible), and presented to the organism.

The organism is considered to be the learner in an applied situation. He is considered to perceive the stimuli and to produce some type of specific measureable response based on his perception of the stimuli.

The response is considered to be the action of the organism which is attributed to the nature of the stimuli and the perception of the organism. Response in this context refers to some predetermined concept of appropriate behavior resulting from the stimuli.

A Model of Communication Theory[2]. --The basic minimum elements of the communication model are sender, receiver, and message (Figure 2).

Senders and receivers change roles during the communicative act hence they could be designated as communicants.

---

[1] It is recognized that there are several theories of learning which are currently accepted by psychologists. The simplified version presented here is an extract of the major components which can be found in almost every model of learning theory.

[2] From the many models describing the communication process the elements which appear here are generalizations based on the common aspects of several models.

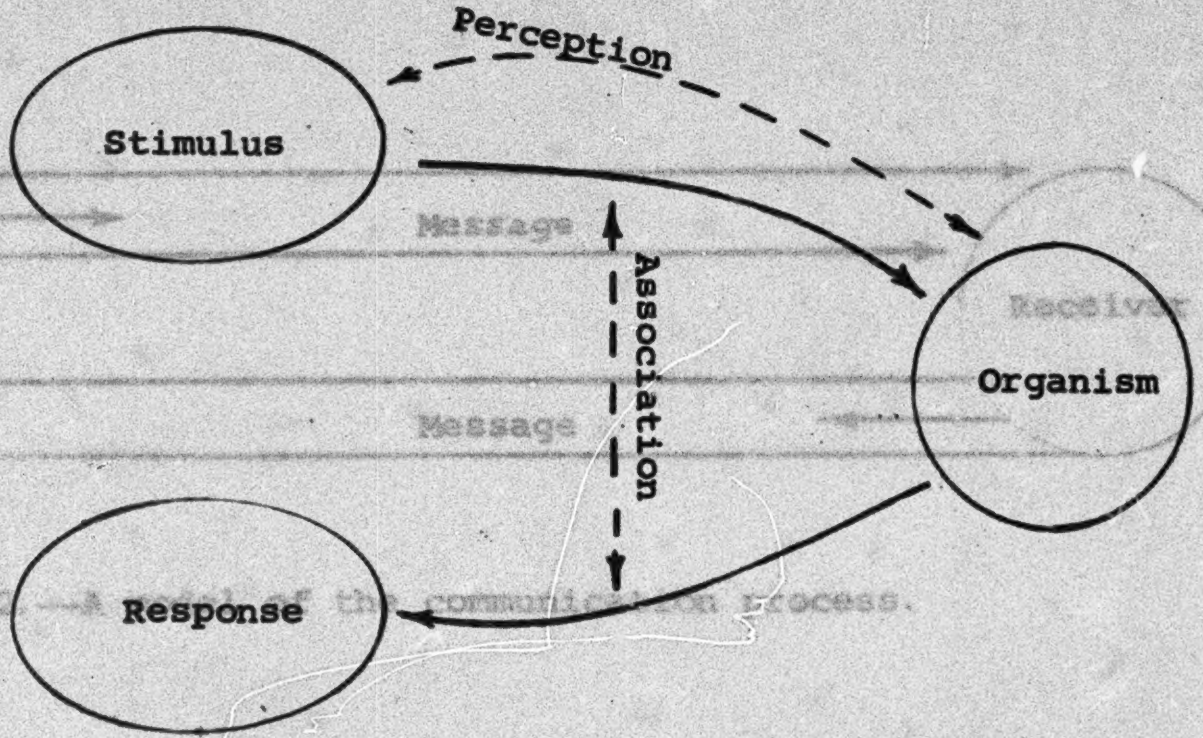
Perception
Stimulus
Association
Organism
Response

Fig. 1.—A model of learning theory.

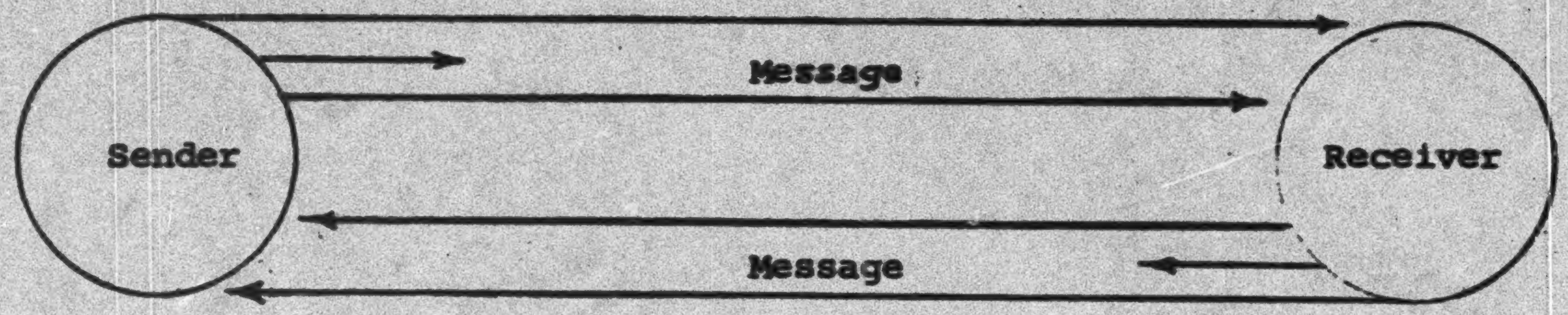
Sender
Message
Receiver
Message

Fig. 2.—A model of the communication process.

They are complementary organisms which operate within an optimal linkage situation. Since the characteristics of each communicant are complementary, the two prime functions of input and output occur within the optimal linkage situation and vary in direction (Figure 3).

Optimal linkage is designed to show the mutual roles of communicants in the transmission of messages. Two communicators, even of the mechanical type must be linked in some manner. Each communicant must perform some function in this linkage.

An Audiovisual Model.--The model of learning theory (Figure 1) and the model of communication theory (Figure 2) are considered to be grossly congruent (Figure 4). The derivation of principles between elements will differ in terminology and will not be totally applicable from one field to another. The audiovisual field should translate these elements and their corollaries into an applied framework. Fundamental to this translation is the idea that the functional relationship of elements will be defined in terms of a technological systems framework.

Applied Terminology (see Figure 3).--The optimal linkage concept is now defined as the instructional situation. The function of the audiovisual specialist is the improvement of instruction; therefore, the meeting ground between the specialist and the student is the

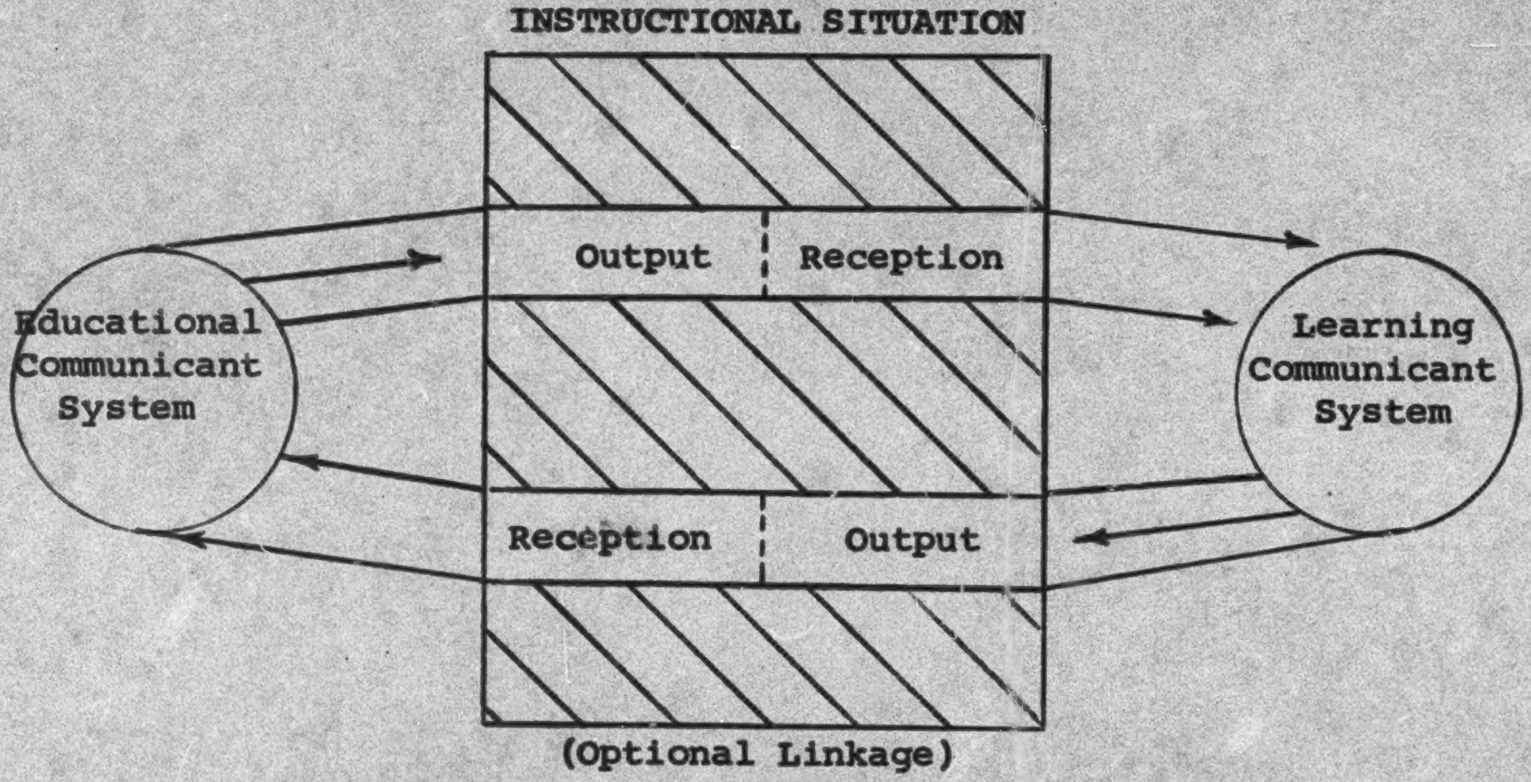
INSTRUCTIONAL SITUATION
Educational Communicant System
Output
Reception
Reception
Output
Learning Communicant System
(Optional Linkage)

Fig. 3.--The educational-communication process.

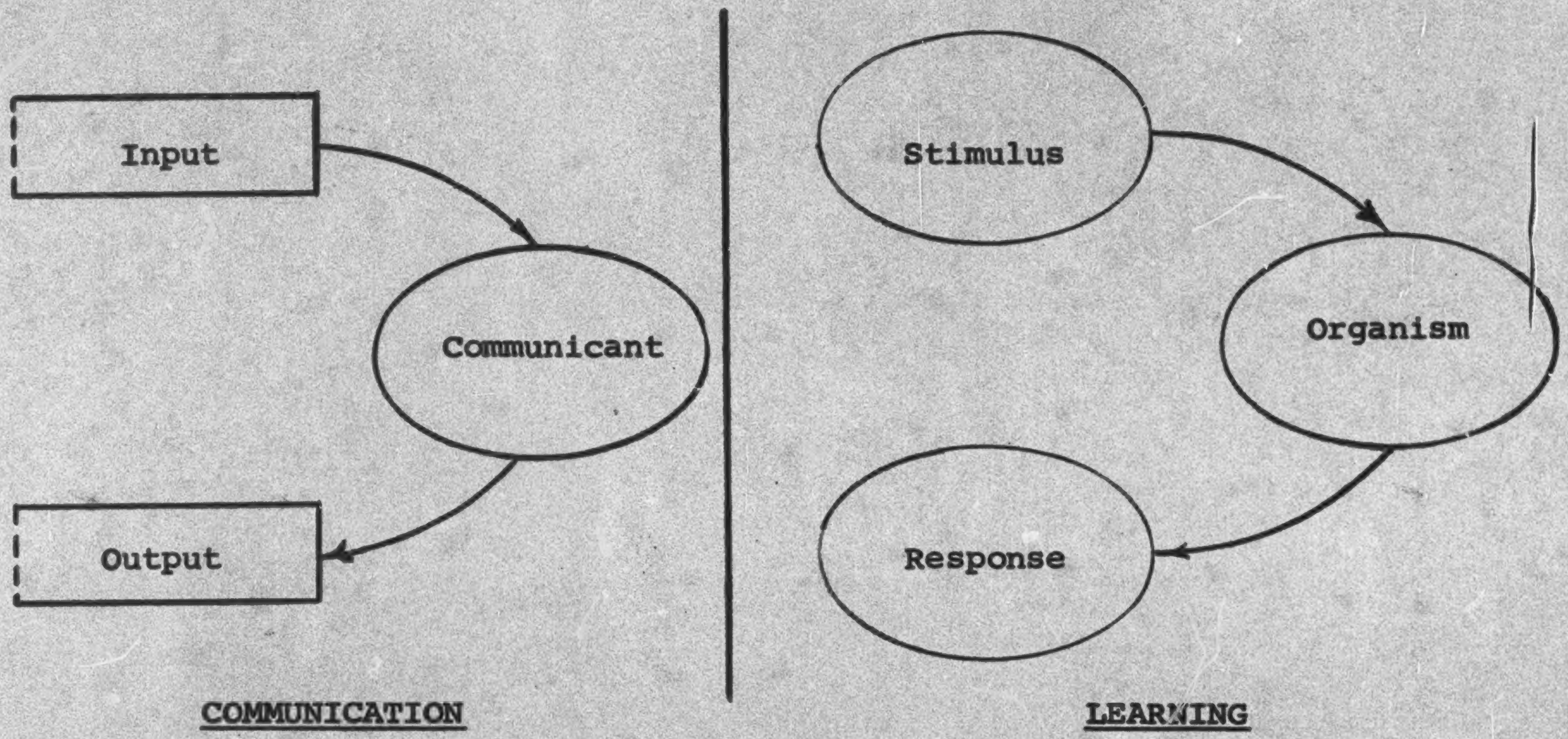
Input
Communicant
Output
COMMUNICATION
Stimulus
Organism
Response
LEARNING

Fig. 4.--Learning and communications models compared.

instructional situation. The instructional situation is not identified as the classroom for the express purpose of implying a variety of situations which might not be conceivable at this stage of development.

One organism, or sender-receiver element, is now defined as the *learning-communicant system*. The term "communicant" is chosen as one which might appropriately suggest the dual functions of reception and response; the adjective "learning" is attached to indicate the basic role of this unit as opposed to the basic role of the educational system. The learning-communicant system refers to a student population of any size, from the single student to the entire student population in a large educational enterprise.

One organism, or sender-receiver element, is now defined as the *educational-communicant system*. This terminology was selected to suggest the multiple elements which might be operating as a communicating organism and to indicate the basic role of this unit as opposed to that of the learning unit. The educational-communicant system refers to professional persons in a school unit of any size, from a single classroom to a large school system or institution.

Audiovisual communications has been considered one specialization within education. In considering the connections between education and learners, it must be stated that other elements of education, as a larger organism, will be operating. Delineation of the role of instructional technology within the educational system will require greater specification, thus the development of an audiovisual model is related to the broader framework of education per se.

The prime function of the audiovisual system is the design and use of messages as presentations, a special output function in the instructional situation.

When discussing presentations, five major elements are involved: Messages, Media-Instrumentation, Men, Methods, and Environment (Figure 5).

Messages indicates the information to be transmitted--the content, the meaning.

Media-Instrumentation indicates the transmission systems (the materials and devices) available for carrying the selected messages.

Men indicates the personnel required to control or assist in the information--transmission or the presentation.

Methods indicates the specifications and techniques required for effective presentations.

Environment indicates the controls or requirements of the given conditions within the instructional situation.

Within these definitions and in view of a systems

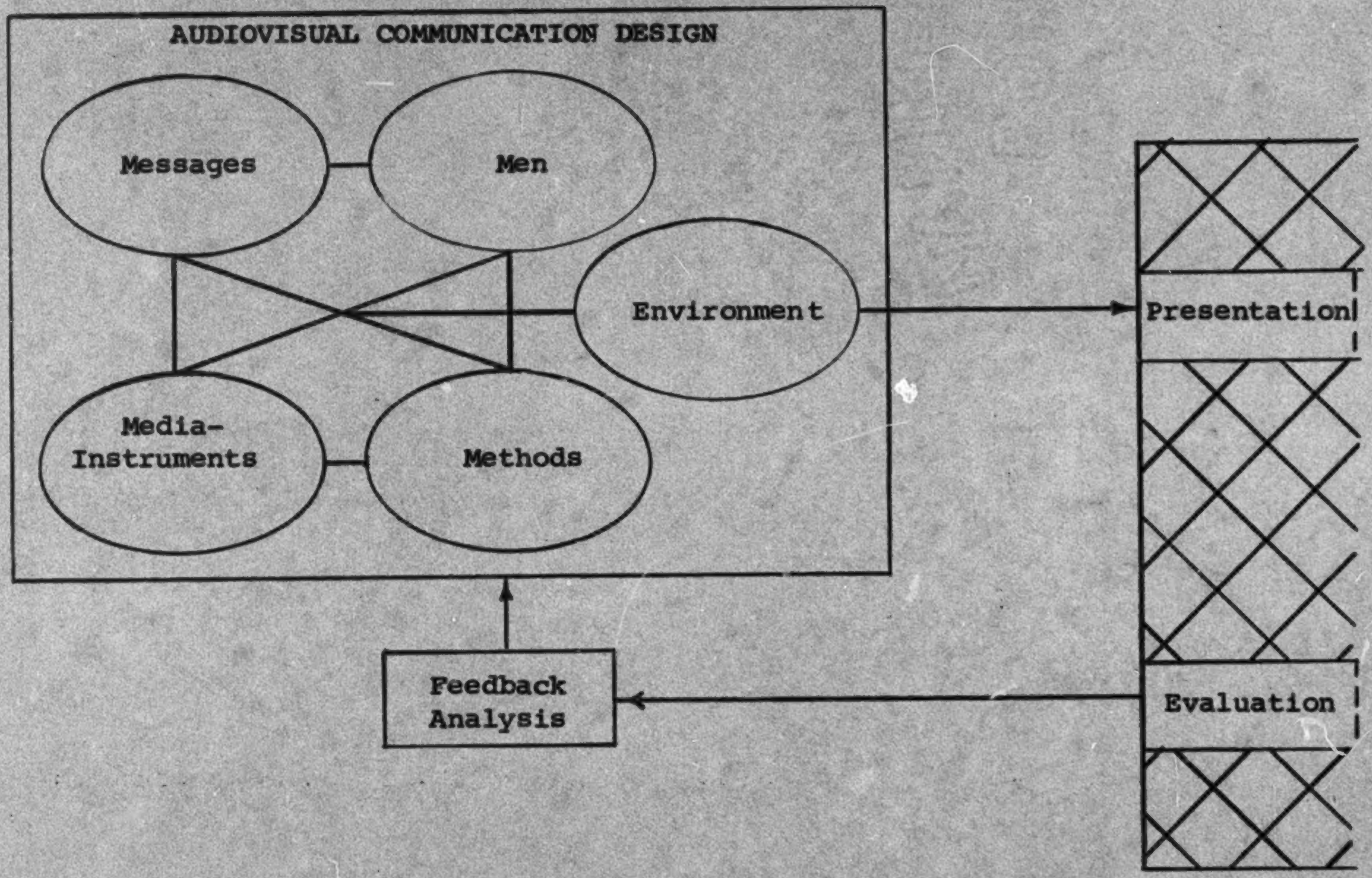
AUDIOVISUAL COMMUNICATION DESIGN
Messages
Men
Environment
Media-Instruments
Methods
Presentation
Evaluation
Feedback Analysis

Fig. 5.--The audiovisual communication sub-system.

approach, the task of the audiovisual specialist could be described as assisting in the appropriate design of a presentation which utilizes the elements of messages, media-instrumentation, men, methods, and environment. The appropriate combination of these elements implies a systems approach.

Broader Contexts for the Systems Concept (see Figure 6).--If the work of audiovisual specialists is considered to be the operation of a technological system, it must be recalled that audiovisual communications is considered a specialization within education. If the systems concept is to be applied with some consistency and utility, the relationships between the specialization and the educational system must be noted.

First, it can be seen that traditional audiovisual concerns have been placed primarily within the concept of media-instrumentation and partially in the concept of messages. One implication of this audiovisual system is that messages might be more appropriately derived from some external source. Thus it is reasoned that message selection occurs outside the context of the audiovisual design system. This message selection might be considered as one way of stating aspects of curriculum design as we know it today.

Second, the inclusion of "men" in the audiovisual design system has been specifically related to the

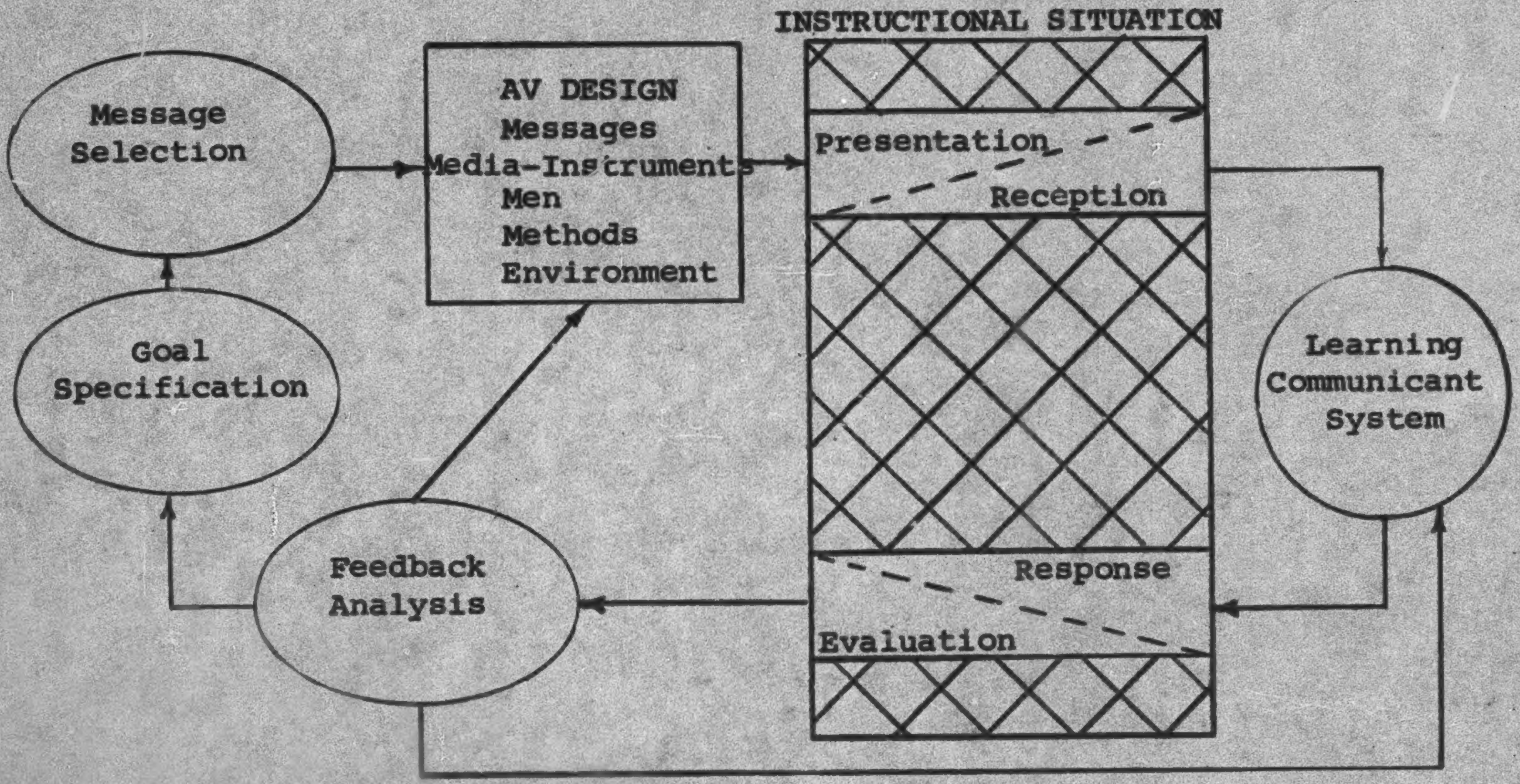
INSTRUCTIONAL SITUATION
Message Selection
Goal Specification
AV DESIGN
Messages
Media-Instruments
Men
Methods
Environment
Presentation
Reception
Response
Evaluation
Learning Communicant System
Feedback Analysis

Fig. 6.--AV relationships to educational-communication process.

presentation element of the larger model. Thus, audiovisual communications is related to educational personnel in the instructional situation.

Third, consideration of any of the design system elements requires close and continuing attention to the learning communicant who is the intended receiver of the presentation. Thus, elements of the design situation must take into account any useful knowledge available about the learning communicant. This is justified by the nature of the learning model and the communication models on which the audiovisual model is based.

Fourth, the presentation which is the immediate end product of the audiovisual specialist's work is designed (according to the learning and communication bases) to achieve some defined response. Thus, attention must be given to responses made by the learning communicant, to verify the fact that the presentation was actually linked to the learning communicant and, if possible, to verify the nature and amount of the linkage achieved. In addition, the process framework and the implications of learning theory and communication theory are that the presentation organism must receive some input from the reception organism. The nature of the educational system and the specific function of the audiovisual specialist demands some input function related to the appropriate output (presentation).

Again, if the primary goal of the educational system is considered to be the appropriate response of the learning communicant, the response of the learning communicant should be measured against intent or goal of the educational system. This is implied most specifically by the model of learning theory.

This, in turn, implies the specification of goals by the educational system. The inference then becomes that goal specification is the original task of the educational system and that message selection is based upon goal specification.

Within this conceptual framework the linkage of two units in a communication situation is completed, the functioning of the external communicant is specified, and the role of the audiovisual specialist within the broader educational system is defined more specifically.

CHAPTER IV

FUNCTIONS OF PERSONNEL WITHIN THE FIELD

The first two chapters of this monograph presented the need for a definition of the audiovisual field and the historical perspectives which would undergird a functional definition. The third chapter stated a definition and delineated the rationale upon which the definition was based. This chapter relates the definition to personnel who serve within the broad area of instructional technology.

A. Distribution[1]

Historically, the audiovisual program has been D-38
organized and developed with a major emphasis on equipment and materials distribution (e.g., selection, cataloging, storage, maintenance, consultation with user). This emphasis is understandable and necessary during developmental stages. With the available equipment, no picture could be projected, no sound could be heard unless the mechanical aspects were mastered. If the clerical functions of storing and cataloging were not mastered, the person responsible for the program failed in the area where he was supposed to assist.

The traditional services of the audiovisual program must be continued if basic instructional resources are to be provided for teaching personnel. However, these traditional services alone cannot be the program. The distribution functions can be assimilated by non-professional personnel.

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[1] The ideas for this section are drawn from Charles F. Hoban's paper, "A Systems Approach to Audiovisual Communications" in Audio-Visual Leadership, DAVI, Washington, D.C.

The definition structure, presented in Chapter III, implies that presentations should be stored for future use. A complex storage and retrieval system would be required to implement the functions indicated. However, administration of this facility would be, in most cases, outside of the structure presented as a definition of the field.

B. Production

The "design of messages" implies certain aspects of production. The audiovisual specialist is increasingly involved in the production of materials for local use. The audiovisual specialist will thus become involved in the production of simple still and motion pictures, recordings, broadcasts, graphic materials, etc., which have local significance or cannot be economically mass produced and distributed through commercial channels. Much of this material must be produced on short notice to meet immediate needs.

In actual operation the audiovisual specialist is not necessarily a photographer, a graphic artist, or a recordist. He must be knowledgeable in the production areas so that he is able to direct the production personnel. As a designer of messages he would coordinate the "messages" and "media-instrumentation" elements of the audiovisual design function. He does this with a knowledge of the "men" who will use the "message" and the "methods" which will be employed. The specialist also needs to know the "environment" for the presentation.

C. Consultation

The audiovisual specialist assists instructors after the point of message selection. At this consultation point the audiovisual specialist and the instructor should clearly understand that the message selected has been based upon the broad goals or objectives of the educational system, the course, the unit of study or the single class session. There must be specific objectives which can be stated in behavioral terms before an effective presentation can be developed.

The role of the consultant is one of diagnosis and prescription as well as resource assistance. The definition structure implies some supervision or direction of the actual presentation.

D. Management

The over-all effort to improve instruction through the development and use of meaningful systems of instructional resources must be under the direction of one person in any given institution or school system. In the public schools the individual with the responsibility and authority in this field is likely to be comparable to an assistant superintendent for instruction. In the colleges and universities this individual may be compared with an academic dean or director. Whatever the specific title, this person must direct and coordinate the total effort and see that all the necessary functions are carried out in a unified fashion for maximum efficiency.

E. Application of Functions

The assignment of the various functions will vary from district to district in terms of the size of the organization, the financial support available and the degree of acceptance of the need for utilizing instructional resources in teaching and learning. Teachers and students must be able to receive quick, efficient, integrated service from the team of specialists functioning under a single administrator. This team may include persons now known as Directors of Audiovisual Instruction, Coordinators of Audiovisual Services, Curriculum Materials Coordinators, Directors of Instructional Materials Centers, Librarians, Educational Communications Specialists, Directors of Educational Research, Assistant Superintendents for Instruction, Curriculum Directors, Elementary and Secondary Curriculum Coordinators, Helping Teachers, Subject Specialists, Consultants, D-41

Programers, Television Directors, technicians, photographers, graphics personnel and maintenance men. There must be close cooperation with all other administrators and supervisors. All of the media and techniques of communication must be used internally for successful communication among team members. This is as important as successful communication with teachers and pupils.

Other functions would be corollaries of the major functions. Audiovisual personnel must give attention to dissemination of information, to curriculum analysis, to public relations, to teacher education, to research and to newer technological developments. The performance of these functions will fall within the areas of major responsibility outlined above.

F. Evaluation

The proper performance of the various functions listed must be evaluated regularly, whether carried out in industry, sales, government or education at the federal, state, county, higher education or public school levels. The success of evaluation depends in part upon the success of the research function in providing information and tools for the evaluator. In addition to measuring the effectiveness and efficiency of the specific functions discussed above, there must be an evaluation of the general climate, philosophy and values concerning education which are present in the situation.

As there is increased success in the improvement of instruction through the utilization of systems of instructional resources, there will be greater support, more personnel and the actual development of a technology of education. With adequate theory, experience, personnel, equipment, materials and facilities, students will receive a richer, broader, deeper, more exciting and more meaningful education than has been possible in the past. The definition presented in this monograph is an attempt to move in this direction.

PART II

TERMINOLOGY

INTRODUCTION TO THE TERMINOLOGY

In an applied field such as instructional technology it is necessary to understand and utilize applicable terms from other disciplines in addition to the increasingly complex and varied variety in its own. Such selection depends upon current practices in the field of instructional technology in terms of philosophy, theory, and management, and more specialized areas of study and application which are inherent within the complex of messages, media, men and methods within an instructional system.

It is not the Commission's intention to include every conceivable term in each sub-area of the field; more detailed or specialized guidance may be obtained from technical sources listed in the bibliography. However, this glossary shall serve two very significant functions: first, it provides the general audiovisual practitioner and administrator with a balanced and sufficiently broad basic reference to which he may refer as necessary, and second, it represents the first major attempt to explore and tentatively establish generally agreed-upon parameters in the field of audiovisual communications. The acceptance--or at minimum, recognition--of the terms and their definitions will provide members of the profession with a common foundation of understanding and expression, and should enable each of us to communicate facts and concepts with a greater degree of clarity.

EXPLANATORY NOTES

All terms are listed twice--in the general alphabetical index to facilitate general reference, and in the classification area for more specialized subject reference. In certain instances, a term may be listed in more than one classification area, e.g., AUTO-INSTRUCTIONAL METHODS is defined under "General Concepts" and "Programed Instruction and Teaching Machines." In cases where one definition is significantly different from another, both are listed separately.

In parentheses following the definition of each term T-2 listed in the glossary is its original published or unpublished source which is more fully annotated in the bibliography.

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*Abbreviation used in the terminology

ALPHABETICAL LISTING
OF TERMINOLOGY

A

A-B ROLLS Rolls of original film, or other film used to reporduce prints of the completed motion picture, that are prepared for printing in synchronized form and designated "A roll," "B roll," "C roll," and so on. A-B roll editing permits the printing of all scenes on the finished prints without evidence of splices. (Gordon)

ABERRATION Color or image distortion in a lens or optical system. (Lewis)

ABSTRACT Ideas and concepts that depend upon the capacity of the mind for understanding, rather than upon the physical senses. They are often presented through symbols which have been given meaning through associations or past sensory experiences. (Brown)

A.C. See ALTERNATING CURRENT

ACADEMY LEADER The leader specified by the Academy of Motion Picture Arts and Sciences as standard for motion-picture prints for distribution in theaters and television stations, commonly placed on 35mm and 16mm film by request. Adherence to the recommended use of the leader permits smooth, unnoticeable change-overs from one reel to another during the running of the film. (Gordon) T-8

ACCESSION A library term describing all the administrative work necessary to receive, inspect, catalogue, mark and identify, and place in storage for distribution. (Gordon)

ACETATE FILM Shortened term for cellulose acetate, the chemical base used in safety film. Practically all 8mm and 16mm film is acetate, as is the 35mm film used in 2" X 2" slides and filmstrips. (Kinder)

ACOUSTICS The science concerned with the attributes of sound. Also, loosely, the sound characteristics of an enclosure, such as a room. (UFPA)

ACQUISITION See TERMINAL BEHAVIOR

ADAPTIVE TEACHING MACHINE See TEACHING MACHINE

AIDS, INSTRUCTIONAL See INSTRUCTIONAL AIDS

AIRBORNE TELEVISION See STRATOVISION

ALIGNMENT, HEAD Adjusting the record-playback head so that the angle of its gap is exactly perpendicular to the tape as it moves past. Misalignment of the head azimuth or head-gap angle results in poor sound. (USOE)

ALTERNATING CURRENT Electric current which alternates direction rather than following continuously in one direction. See also DIRECT CURRENT. (D & T Comm)

AM RADIO See RADIO, AM

AMBIENT LIGHT Illumination from sources that may interfere with planned lighting. Ambient light falling on a TV receiver screen may show up as distracting "hot spots." (Lewis)

AMMETER An instrument for measuring the amount of electricity flowing through a wire. (D & T Comm)

AMPERE The unit for measuring the flow of electrical current. T-9
(D & T Comm)

AMPLIFIER, POWER Amplifier designed to boost signal energy sufficiently to operate a loudspeaker. See also PREAMPLIFIER. (USOE)

AMPLITUDE MODULATION (AM) A technical term used to denote a standard radio. The low or medium frequency AM waves follow the curvature of the earth. See also RADIO, AM. (Kinder)

ANALOGUE COMPUTER Computer system or machine whose input and output are basically continuous variables--usually measurements, length, depth, temperature, etc. There is no point at which absolute values are considered available as absolute. (IBM)

ANAMORPHIC LENS A lens designed to distort an image in a systematic way, usually by means of an element or elements having cylindrical rather than the usual spherical surfaces. Such a lens usually is designed to compress the image along one axis of the focal plane, leaving the image unaffected in the focal plane direction at 90° from that axis. The object usually is to obtain a wide-screen image by projecting such a picture through a correcting lens having the same characteristics as the lens used on the camera. (UFPA)

ANGLE SHOT A shot continuing the action of a preceding shot, but from a different camera angle. See also SHOT. (UFPA)

ANIMATION The art or process of synthesizing apparent mobility of inanimate objects or drawings through the medium of cinematography. This is usually achieved by exposing film in a motion picture camera to such materials in units of one, two, or three frames (single-, double-, and triple-frame animation) before movement of the materials or images to the position to follow. (UFPA)

ANSWER PRINT The first combined picture and sound print, in release form, of a finished film. It is usually studied carefully to determine whether further changes are required prior to release printing. (UFPA)

ANTENNA A conductor or system of conductors with which radio or television signals are received or transmitted through space. Some antennas are formed of suspended wires; others are formed of metal rods. In a microwave system a parabolic reflector or dish is employed for this purpose. (Lewis)

APERTURE An opening in the lens system of a camera through which light passes from the scene through the lens to the film. In a projector, light passes through the aperture to the film and thence to the screen. This aperture also "frames" the film image. In a camera, the aperture may be adjusted by means of an iris to vary the size of the lens opening, thus affecting the amount of light which strikes the film (assuming the same exposure time). (Brown) T-10

APERTURE GATE The part of a motion picture projector consisting of the aperture plate, which determines the exact framing of the image on the screen, and the aperture shoe, a pressure shoe that holds the film snugly against the aperture plate during projection; not to be confused with "camera gate," the motion picture framing device. (Gordon)

AUDIENCE An assembly of hearers or viewers reacting, usually passively, to a speaker or performer. (Until the advent of broadcasting, a group in physical proximity was meant, and the performer was interacting with his audience. (English)

AUDIO Of or pertaining to sound. Specifically, a sound recording. Loosely, any part or all of the complex of sound equipment, facilities and personnel. (UFPA)

Audiovisual Library – Definition

An audiovisual library is a selected collection of one or more types of materials used in the process of audiovisual communication, organized for use by those served by the library, together with the housing facilities, equipment, supplies, operating funds, and staff required to make this use possible.

An audiovisual library may include branches or other facilities located apart from a main center so that they are most accessible to users, together with transportation and communication facilities, including broadcast or closed circuit facilities, required to make possible the use of available audiovisual resources.

Audiovisual communication materials are those materials which emphasize use of sight, sound, touch and other means of providing sensory representations of information. The scope of such materials is so wide that it is easiest to define them by saying that they are generally understood to include all informational materials and devices except printed materials bound in book or pamphlet form. In practice they definitely include such materials as: projected and televised still and motion pictures with or without accompanying sound; recorded, transmitted, or broadcast sound materials; three dimensional materials such as objects, specimens, models and exhibits and displays including such materials; graphic representations, such as maps, charts, diagrams, and displays of such materials. The nature of these materials is such that audiovisual libraries may also include facilities for the local preparation of such materials as well as facilities for their storage, handling, use, and maintenance.

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AUDIOACTIVE Term sometimes used to refer to listening-speaking practice. Also used to describe facilities in which students are equipped with headphones, preamplifier, and microphone by means of which the student's voice is amplified and carried simultaneously to his own headphones as he speaks. (USOE)

AUDIOLINGUAL New term which replaces "aural-oral" and refers to that element of language (sound) which is spoken in normal, everyday, conversational interchange as differentiated from language as gesture or as writing. (USOE)

AUDIOPASSIVE Terms sometimes used to refer to listening practice when no oral response is expected. Also used to describe facilities in which students are equipped with headphones only. (USOE)

AUDIO-VIDEO MIXER A device that combines the video signal from a TV camera and the audio signal from a microphone or similar source and impresses them on a carrier signal for transmission on a closed-circuit system. (Lewis)

AUDIOVISUAL COMMUNICATIONS That branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process. It undertakes: (1) The study of the unique and relative strenghts and weaknesses of both pictorial and nonrepresentational messages which may be employed in the learning process for any purpose; and (2) The structuring and systematizing of messages by men and instruments in an educational environment. (This includes the planning, production, selection, management and utilization of both components and entire instructional systems.) Its practical goal is the efficient utilization of every method and medium of communication which can contribute toward developing the full potential of the learner. Earlier definitions: (1) That field of human expression that employs visual and auditory aids to learning, including motion pictures, television, sound and silent filmstrips, slide sets, recordings, transparencies, projected opaque pictures, and a variety of graphic arts (Gordon); (2) Used to identify instruction and learning procedures which emphasize nonprinted instructional materials. A more exact definition implies any learning experience involving both sight and sound (Cross); (3) A generic term referring to experiences, equipment, and materials used for communication in instruction. Implies techniques based upon practices utilized in education and training. (Brown) T-11

AUDITION Implies listening, and usually is used to identify the experience of appraising an audio material or oral performance for instructional value and quality. (Brown)

AUTO-INSTRUCTIONAL DEVICES (1) The technology of machines and systems devoted to mass instruction, including various applications of television and the massed film systems, such as EBF's physics and chemistry series; (2) Those systems and machines for individual instruction, which include individual reading pacers, individual viewing and listening equipment, language laboratories, programmed printed materials, and the true teaching machine of the Skinner or Pressey type, using verbal and pictorial programs with various ways, electronic and mechanical, for responding and being informed of errors and progress. (Finn)

AUTO-INSTRUCTIONAL METHODS Synonymous with "programed instruction, programed learning, automated teaching, self-instructional materials," etc. The term "auto-instructional" was proposed by Lumsdaine and Klaus to circumvent "misleading, prejudicial, or both" connotations attributed by them to the other lables. The teaching machine would be called an "Auto-Instructional Device" (AID) (Markle) T-12

AUTOMATIC SHUTOFF Special switch on some tape recorders which automatically stops the machine when the tape runs out or breaks. Also called "automatic cutoff." (USOE)

AUTOMATIC TUTORING The term for "programed instruction" most frequently used with "intrinsic programing." (Markle)

B

BACK LIGHT See LIGHTING

BALANCE Relations between high and low frequency tones of a recording. Also the relation between the levels of two audio signals. (USOE)

BALOPTICON An instrument for the projection of opaque materials. The current name for such a device is OPAQUE PROJECTOR (see glossary). Currently, in television production, a balopticon or "balop" projects opaque or flat illustrations Originally a trade name. (Brown)

BAND A group of tracks, usually on a drum, used to store characters in serial fashion. The bits comprising one character are stored in parallel, one track for each bit. (IBM)

BARN DOORS Hinged metal plates attached to certain lighting sources. The manipulation of these plates permits better control of the light falling on the set. (Lewis)

BASE LIGHT The major or over-all lighting source adjusted to give as near a shadowless effect as possible and at such a light level as to permit effective image pickup. Supplementary light sources may be added for technical effects. See also LIGHTING. (Lewis)

BEADED SCREEN A projection screen which surface consists of innumerable minute glass beads. At a limited angle it gives a high quality reflection. (D & T Comm)

BEHAVIOR This term is presupposed by SEMIOTIC and not defined within it. Roughly speaking, behavior consists of the sequences of responses (actions of muscles and glands) by which an organism seeks goal-objects that satisfy his T-13 needs. Behavior is therefore "purposive" and is to be distinguished from response as such and from the even wider class of reactions. Behavior is individual or social, and when social may be cooperative, competitive, or symbiotic. (Morris)

BIAS High frequency current fed into the recording circuit to eliminate distortion during the recording process. Also performs function of erasing tape just before it passes the recording head. (USOE)

BINARY NUMBER SYSTEM Compared with the usual decimal system—which has nine digits and a zero—the binary system has only one digit, 1, and a zero. Thus, the first ten whole numbers of the binary number system (with their everyday equivalents in parentheses) are: 0 (0), 1 (1), 10 (2), 11 (3), 100 (4), 101 (5), 110 (6), 111 (7), 1000 (8), 1001 (9), 1010 (10). The binary number system is used in many electronic computers and in information theory. (English)

BINAURAL Of both ears functioning together. (D & T Comm)

BIT (1) A unit measure of amount of information: the bit is that amount which, put into a given assemblage consisting of a known number of alternative outcomes for a certain event, reduces the alternatives by one-half. (If we are tossing a coin, the chances of getting head or tail are even. To reduce the alternatives by half, i.e., to specify that the coin will fall head, not tail, requires one bit of information. The fommula is bit = $\log_2 k$, where k is the number of alternatives.) (English) (2) The smallest part of the array which can be interpreted; e.g., coded characters in the form of an array consisting of (seven) bits; each bit can be either, 1 or zero. (IBM)

BLIMP A soundproofing device that fits over the camera to prevent camera noise from reaching the microphone. Some blimps are integral with the camera, while others are containers capable of housing more than one type of camera. (Gordon)

BLOCK SORT To break a deck of data cards into decades by the highest order code digit so that smaller groups can be handled and work expedited by feeding sequenced data to a succeeding procedure step more quickly. (IBM)

BLOWUP To enlarge a photograph or negative. (D & T Comm)

BLUE-LINE PRINT (1) A positive print with a blue image usually produced by the diazotype process. (2) Also used to designate a blueprint with blue lines on a white field, made by printing from a negative master. (NABDC)

BLUEPRINT PROCESS Reproduction method using light-sensitive iron salts, which produces a negative blue image from a positive master. (NABDC)

BOOM (CAMERA) A sturdy vehicular support providing vertical, horizontal, pivotal, and translational movement for camera and operator, enabling them to assume, rapidly and conveniently, almost any desired angle in relation to the scene to be photographed. (UFPA)

BOOM (MICROPHONE) A support, the more elaborate ones vehicular, incorporating a telescoping pole arrangement for suspending and manipulating a microphone in order to obtain its optimum orientation and position outside the camera's field of view. (UFPA)

BOOTH Sound treated cubicles for student stations in electronic learning laboratories. The acoustical partitions are usually on three sides. The front partition may be a collapsible, sliding, or folding panel or it may be made of transparent materials such as plexiglass. (D & T Comm)

BRAKING MECHANISM Apparatus on a tape recorder which stops the motion of the reels; if not properly adjusted, tape spillage, stretch, or breakage may occur. (USOE)

BRANCH A choice point at which students are sent to alternative items depending on their responses to the particular item. A common use of branching is in intrinsic programs, where the branch (or loop) consists of a single item explaining why a particular answer is incorrect and returning the student to the original item for another try. A criterion item may be inserted in a linear program and, if the student passes it, he is sent forward several items (FORWARD BRANCHING): if he fails the criterion item, he takes an intervening sequence of review or remedial items. A student may, at a criterion item, be sent backward in the program to repeat items he has already seen but inadequately mastered (BACKWARD BRANCHING or "WASH-BACK"). Students may be "branched" on the basis of either constructed responses or multiple-choice responses, although the latter predominate. (Markle)

BROADCAST The transmission of radio or television signals through space via electronic devices; also termed "wireless" transmission; the term "telecast" is sometimes used when restricted to television broadcast. (D & T Comm)

BULK ERASER See ERASER, BULK

C

CABLE A series of conductors insulated from each other and arranged in a variety of patterns to perform transmission, control, audio, and power supply functions in an electrical system. Coaxial cable is designed to pass a wide range of frequencies and is particularly adapted to video and RF transmission applications. (See COAXIAL CABLE for further clarification.) (Lewis)

CAMERA CHAIN A television camera connected to a control unit and viewing monitor. (Lewis)

CANDLE POWER The illuminating intensity of a single standard candle; a foot-candle is equal to the light from a one-candle-power source at a distance of one foot. (Lewis)

CAPSTAN Rotating spindle or shaft which draws the tape across the heads (of a tape recorder) at a constant rate of speed on both recording and playback. Operates in conjunction with a rubber pressure roller. (USOE)

CARBON ARC PROJECTOR Type of projector illuminated by an electric spark between two rods of carbon; projector with a hot bright light. (Kinder)

CARD PUNCHING UNIT Machine for taking data and converting the data into coded holes in standard cards. (IBM)

CARD READING UNIT A unit which reads holes in standard cards. (IBM)

CARRIER WAVE In radio or television broadcasting, the wave whose amplitude, frequency or phase is varied or modulated to transmit a signal or combination of signals. (D & T Comm)

CARTOON An interpretative drawing which satirizes or exaggerates in order to stress a point. (Kinder)

CCTV See CLOSED-CIRCUIT TELEVISION

CELL Another name for a transparency made of acetate for use in projectors. Cells are usually 3½" × 4", but may be 2" × 2", 6" × 8", etc. (Kinder)

CENTRAL SOUND SYSTEM An inter-communication system used in schools, or other large institutions, which permits messages, music, or programs to be transmitted to rooms throughout a building or group of buildings. Provides communication for administrative or instructional purposes. (Brown)

CHAINING The linking together of a series of discriminable responses in a particular order. The completion of the first response is said to provide the stimulus for the second response. In typical laboratory examples, reinforcement is given at the end of the chain of responses. A classroom parallel can be seen in the solution of a long-division problem: each step in the procedure could be separately taught, even in a random order, but the final performance requires a prescribed order to achieve the solution. Providing a student with knowledge of results at the end of the solution sequence would parallel the provision of reinforcement following the final response in a chain. (Markle)

CHALK TALK A visualized presentation written or drawn on a chalkboard and accompanied by narration. The drawings are usually essential to the chalk talk. A chalk talk is frequently used to supplement lectures of discussions. (Cross)

CHALKBOARD A board, the surface of which may be of slate or plastic or treated wood, upon which one may write or draw with chalk. See also MAGNETIC BOARD. (Cross)

CHANNEL (RADIO/TV) A specific band of frequencies assigned to each radio or television station. In some closed-circuit applications, the video and audio signals are fed into an audio mixer tuned to a specific channel, enabling the signals to travel by means of a coaxial-cable system rather than through space. (Lewis)

CHANNEL (DATA PROCESSING) A shielded line over which pulses travel from one unit to another within the calculator. (IBM)

CHANNEL (INFORMATION THEORY) A complete system for transmitting a signal from an input location to an output location. (The channel includes the properties not only of the apparatus or equipment in the system, but of the code of language used. The channel may be an organism, in which case the sense organ is the input location and the motor mechanism is the output location. But it may also be purely mechanical, as is telephony; or it may be an institution such as a newspaper or news service, or any combination of physical, organic, and social transmitting media.) (English)

CHANNEL, DUAL (TAPE RECORDING) Usually a stereophonic (dual-track) recorder adapted so that two separate channels (program signal and student signal in an electronic learning laboratory) are recorded simultaneously or sequentially on two separate tracks of the same tape. Special switches and circuitry allow the student channel to be rerecorded without erasing the program channel. (USOE)

CHANNEL, MULTI (TAPE RECORDING) When applied to program source, this means that several sources can be transmitted simultaneously to selected student positions in the language (or learning) laboratory network. When referring to a recorder, it means that several different signals or channels are recorded or played back simultaneously but separately through a multitrack recorder. (USOE)

CHECKERBOARD A technique of splicing AB rolls in order to eliminate the image of the film splice from the duplicates. The physically overlapped portion of the film is covered to the frame line in all cases by black leader, thus effectively preventing transfer of the splice image. (UFPA)

CINCH MARKS Scratches on film caused by the presence of dust or other abrasive particles between successive coils result in a scratch mark on either or both sides of the film. Longitudinal cinch marks may result if the center of a roll of film is rigidly held while the outside end is pulled tight. (UFPA)

CINEMATOGRAPHER A motion picture director of photography, cameraman, or assistant cameraman. (UFPA)

CINEMATOGRAPHY Motion picture photography; the creation of the illusion of motion through motion picture techniques. Loosely, the entire complex of activities involved in the staging, direction, photography, editing, and presentation of motion pictures. (UFPA)

CLEAN When applied to sound, this means undistorted and noise-free reproduction. (USOE)

CLOSED-CIRCUIT TELEVISION A modified type of television in which the signals are transmitted by coaxial cables instead of sound waves. These telecasts are limited in range and, since they are not broadcast on the air waves, no license is required. (Kinder)

COAXIAL CABLE Designed to carry many radio, telephone, and television signals simultaneously, if desired. Technically, a central conductor or wire surrounded by some type of insulation over which a wire mesh or tube is placed. The central wire and outside conductor are concentric and serve as the conductors. (Lewis)

CODE An agreed transformation, or set of unambiguous rules, whereby messages are converted from one representation to another. (Cherry)

CODE CAPACITY The maximum possible rate at which information can be sent through a code channel. (English)

CODE CHANNEL A system whereby a sequence of signals related to a given code is transmitted at a given rate. (English)

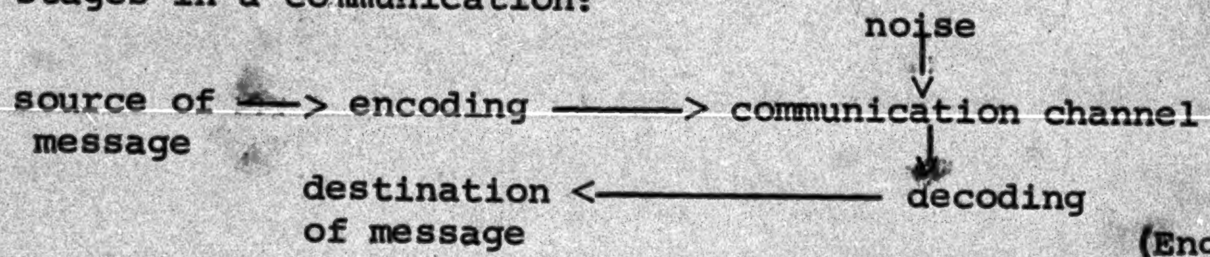
COLOR (1) Photography in natural color, as compared with photography in black and white. (2) The psychological sensation arising as a result of ocular perception of, and discrimination between, various wave-lengths of light. (3) Any feature incorporated in a scene for the sake of its contribution to the authenticity of the scene. (UFPA)

COMMUNICANT An organism that interprets a sign produced by a communicator. (Morris)

COMMUNICATION (1) When restricted to signs, communication is the arousing of common . . . (significations) by the production of signs. It is language communication when the signs produced are language signs. Not all communication is language communication. (Morris); (2) The arousal of common meanings, with their resulting reactions, between communicator and interpreter through the use of signs and symbols. Communication is a social act and involves two or more persons in a field situation. In the face to face situation the roles of the communicator and interpreter are constantly shifting. In other situations there is less possibility for this interaction (Fearing); (3) The establishment of a social unit from individuals, by the use of language signs. The sharing of common sets of rules, for various goal-seeking activities (Cherry); (4) The establishment of a commonage of significations ("meanings") by the production of signs. It is language communication if the signs are language signs. (Adaptation from Morris by Knowlton)

COMMUNICATION/HUMAN (1) (Communication Theory) The subscience that investigates the relations between persons who select messages (sources) and persons who interpret and are affected by them (destinations); (2) The study of mass media of communication and their effects on mass audiences, other cultures, etc. (This usage somewhat arbitrarily restricts the meaning of the term.) (English)

COMMUNICATION MODEL (C.E. Shannon) A display of the steps or stages in a communication:



(English)

COMMUNICATION UNIT (Communication Theory) A complex unit consisting of source, transmitter, receiver, and destination. (In the model for human communication the source and the destination are persons. The former selects messages and by means of the transmitter--the motor system of the individual--encodes the message and starts it on its way through the communication channel in the form of signals--words, gestures, etc. These signals are picked up by the receiver--a sense organ and its brain connections--of the person who is the destination. The signals are decoded--receive a meaning--as a central process in the destination.) (English)

COMMUNICATIONS THEORY A technology (not a theory) that deals with communication in all its aspects--physical, psychological, sociological. (The parallels between processes of communication in machines, organism, and institutions are described; and common terms for parallel processes are invented or adapted from old ones. Since INFORMATION is what is communicated, there is much overlap with INFORMATION THEORY. (English)

COMMUNICATOR An organism that produces a sign that is a stimulus in social behavior to some organism (the communicatee). (Morris)

COMMUNITY RESOURCES In education, any materials, agencies, activities, or persons in a community that may be utilized by a school program to provide learning experiences. (Brown)

COMPOSED RESPONSE See RESPONSE, CONSTRUCTED

COMPOSITE PRINT A positive motion picture print containing both the picture and the sound. (Gordon)

COMPOSITION In photography and art, composition refers to the planned arrangement of items or objects which make up the picture. (Kinder)

COMPUTER A device which can accept information and supply information. The supplied output information is derived from the accepted input information. (IBM)

CONCEPT (1) Any object of awareness together with its significance or meaning; anything one can think about that can be distinguished from other "things." (2) A general meaning, an idea, or a property that can be predicted of two or more individual items. (3) Knowledge that is not directly perceived through the senses but is the result of the manipulation of sensory impressions. (Thus one may directly perceive in Dobbin certain properties, but for a concept one must also apprehend these properties as constituting part of the general notion of "horsiness." A concept requires both abstraction and generalization--the first to isolate the property, the second to recognize that it may be ascribed to several objects.) (English)

CONCEPTUAL LEARNING A highly developed form of learning in which meanings take on generalized understandings. (Kinder)

CONCRETE Specific; based upon direct sensory experiences, as opposed to abstract. (Brown)

CONDENSING LENS A lens which serves to gather the light rays from a source and to condense or concentrate them. (Kinder)

CONDUIT A kind of rigid or flexible metal pipe or tubing which contains the wires that conduct the signals or current. (USOE)

CONE OF EXPERIENCE A graphic representation of a theory proposed by Edgar Dale in which all general categories of experience are placed at different levels upon a gradually narrowing cone--the rich, personal, sensory experiences at the base, and the highly abstract, symbolic experiences at the top. As we move upward on the cone, we travel from the most direct to the most indirect experiences--for example, from the small child's first building with blocks to $e = mc^2$, a formula in atomic energy. (D & T Comm)

CONSOLE, CONTROL See CONTROL CONSOLE

CONSOLE, TEACHER Teacher's control center (in an electronic laboratory) where a distribution panel controls the transmission of program signals, and may include facilities for two-way intercommunication with individual students or an entire group. (USOE)

CONTINUITY As used in connection with scripts for radio, television, or film production. A specific outline of the sequence of events to be presented. (Brown)

CONTINUOUS LOOP Two open ends of a short length of film, five or six feet, spliced and threaded into a projector. The film is then projected over and over. Longer film length, several minutes or more, requires a special projector or adapter so that the film will be automatically rewound as it comes through the projector. (Kinder)

CONTRAST (1) Lighting Contrast: the ratio between the maximum and minimum intensities of incident light on the subject, or radiated and/or reflected light from the subject; (2) Photographic Contrast: in terms of negative or positive film, the ratio between the optically most dense and least dense areas, expressed in terms of gamma--the tangent of the angle formed by the straight-line portion of the DlogE curve and the logE axis; (3) Subject Contrast: the scale of tonal values exhibited by a subject. If the scale is short, with little range of tone, it is called "flat," whether generally dark or generally light. If the subject tonal scale is reasonably long, with good gradation from black to white, it is regarded as normal. When the subject tonal range is great, and intermediate tones are relatively lacking, the subject is termed "contrasty." (UFPA)

CONTRIVED EXPERIENCES Learning experiences that are designed to simulate real-life situations. They often use real things, or effective substitues for real things, to give verisimilitude to experiences. (Brown)

CONTROL CONSOLE A piece of equipment that incorporates monitors for viewing separate images picked up by various TV cameras in a system, in addition to the switching and other control devices required. When remote-controlled cameras are used, special iris, lens focus, and pan-tilt circuits are included. (Lewis)

CONTROL PANEL The nerve system of accounting machines. These panels are plugged with wires that relay data from the cards to the various machine functions to render desired results. (IBM)

CONTROL ROOM Usually located adjacent to, or as part of , a television, radio or electronic learning lab or studio, with glass panels installed to permit visual contact between the two areas. Contains control console, audio equipment, and other accessories employed by the director, teacher, and/or staff. (D & T Comm)

CONVERSATIONAL CHAINING A programing technique in which the correct answer to an item is not presented by itself but is rather embedded in the text of the following item. Consecutive items are thus closely linked by the necessity of repeating in the new item the word or words that were elicited in the previous item. The response to one item becomes part of the stimulus in the next. (See CHAINING.) The technique was developed and described by John Barlow. (Markle)

CONVERTER An electronic device capable of changing radio and television signals from one class of frequencies to another. Attached to a TV receiver, a converter allows a VHF set to tune in UHF channels. Similarly, a converter installed at the antenna site can perform the same function to permit distribution of the modified signals to many television receivers not ordinarily equipped to receive such signals. (Lewis)

CONVERTER, VOLTAGE An electronic device used in altering voltage supplied to any device. (D & T Comm)

COUNTER, INDEX Similar to an odometer (mileage indicator in automobiles) which indicates the relative amount of tape that has run past the heads. Also called digital counter. (USOE)

CRADLE MOUNT A carefully balanced attachment for the base of a television, motion picture, or still camera that permits tilt-down. It is fastened to the top of the tripod or pedestal. (D & T Comm)

CRAWL A long sheet of paper installed on rollers and containing a series of titles or credits relating to a television program. When placed in an opaque projector (telop) connected to a film chain, each line appears in sequence as the roller is turned. (Lewis)

CRITERION See TERMINAL BEHAVIOR

CROPPING To trim or cut off parts of the picture, to eliminate superfluous portions and thus improve composition. D & T Comm)

CROSS MEDIA APPROACH Methodology based on the principle that a variety of audiovisual media and experiences correlated with other instructional materials overlap and reinforce the value of each other. Some of the material may be used to motivate interest; others, to communicate basic facts; still others, to clear up misconceptions and deepen understanding. Same as MULTI MEDIA APPROACH. (D & T Comm)

CROSS-TALK Interference of one channel with another. Leakage of sound in a system as when one student hears an additional program signal or another student through his headphones. (USOE)

CROWDER-STYLE PROGRAM See PROGRAMING, INTRINSIC

CU (CLOSE-UP) See SHOT

CUE See PROMPT

T-24

CUT (1) The instantaneous change from one scene to another. Successive frames contain the last frame of one scene and the first frame of the following scene; (2) To stop operation of camera, action, and/or sound recording equipment; (3) To sever or splice film in the editing process. (UFPA)

CUTAWAY (1) A scene photographed at the site of principal action, interrupting the flow of action but containing only a part of the view visible to other scenes. The film editor uses the cutaway to bridge two scenes that do not move smoothly from one to the other (Gordon); (2) A real object or a model, made to scale or magnified, in which the outer covering or a portion has been wholly or partially removed so as to reveal the inner structure or framework or working parts. (Cross)

CYCLES PER SECOND (CPS) Unit used to measure frequency, or "pitch," of any sound. (USOE)

D

DARKROOM A room for photographic purposes which is light-proof and which is equipped with special safety lights--usually red, green or orange. (D & T Comm)

DATA PROCESSING The gathering, storing, and processing of numerical and alphabetical information of a business or scientific nature. (IBM)

DATA-REMOTING The storage and handling of data through mechanical-electronic systems. Permits electronic distribution of recorded images without removing the original material from the depository. (Lewis)

DATA-STORAGE TUBE A modified TV kinescope or picture tube equipped to retain selected images for as long as desired. (Lewis)

DAYLIGHT SCREEN A projection screen so constructed that clear images from a projector are visible in an undarkened room. BEADED AND LENTICULAR SCREENS are often placed in this category. (D & T Comm)

T-25

D.C. See DIRECT CURRENT

DECIBEL A unit used for comparative evaluation of sound loudness in terms of the ration of the amounts of power involved. The ear being responsive arithmetically, as sound power increases or decreases logarithmically, a change of one decibel in sound power level is just perceptible by the ear as a change in sound loudness. (UFPA)

DEFINITION Appearance of sharpness or of being in focus of an image. (Lewis)

DEMAGNETIZER, HEAD See HEAD DEMAGNETIZER

DENSITY Defined as the logarithm of the opacity. In general terms, the relative darkness of an image area. (NABDC)

DEPTH OF FIELD Assuming an imaginary line extending from the camera-film plane to the scene of action, the distance along this line from the closest point visible in acceptable focus to the farthest point visible in sharp focus is said to be the depth of field. (Gordon)

DIAZO Light-sensitive component of diazotype materials which reacts with couplers to form axo dyes. (NABDC)

DIGITAL COMPUTER A computer which operates with clearly defined or discrete numbers, as opposed to physical quantities of variables, which are used in an analog computer. (IBM)

DIRECT CURRENT That is, electric current which flows in one direction. (D & T Comm)

DIRECT EXPERIENCE A term generally used to explain a learning process based upon actual experience with real things in a real (true-to-life) situation. Learning to sell by working in a store is one example. (Brown)

DISPLAY (Noun) That which is used in the generation of a sensory experience in terms of content. (TerLouw)

DISTORTION Improper reproduction of the original sound due to any change that takes place as the signal travels through the electronic system. Distortion of sound reduces its clarity. (USOE)

DOCUMENTARY The term to describe the type of motion picture or television program that purports to show reality and in which techniques are secondary to the theme. (Gordon)

DOLLY A platform or frame equipped with wheels or casters on which the tripod or pedestal supporting cameras or other equipment is mounted. (D & T Comm)

DOUBLE FRAME Term applied to a 35mm filmstrip on which the pictures are photographed so that the width of the picture is lengthwise on the film. Double frame pictures are 1½" × 1" and the film is inserted in the projector horizontally. (Kinder)

DRUM A constantly rotating cylinder with a magnetic surface on which data are stored by magnetizing spots on this surface using read-write heads staggered about its periphery. (IBM)

DRY MOUNT A picture mounted by use of a thermal-seal process. (Kinder)

DUAL-TRACK HEAD See HEAD, DUAL TRACK

DUAL TRACK RECORDER A tape recorder which records two tracks on one tape. Each track covers half the track width. (Kinder)

DUAL-TRACK TAPE See TAPE, DUAL TRACK

DUBBING A copy of a tape recording made by recording on one machine what another machine is playing. Sometimes called a duplicate or "dupe." (Brown)

DUPLICATING Creating an exact (or nearly exact) copy of a recording, a drawing, a printed page, etc. (Cross)

DYNAMIC RANGE Ratio between the softest and loudest sounds a recorder can reproduce without undesirable distortion. Usually measured in db's. (USOE)

E

EARPHONES See HEADPHONES

EDITING The process of assembling, arranging, and trimming film, both picture and sound, to the best advantage for the purpose at hand. Same as "cutting." (UFPA)

EDUCATIONAL STATION A broadcasting station (AM, FM, TV) operated on a non-profit basis in the interests of cultural development. It accepts no advertising. (Kinder)

EDUCATIONAL TELEVISION (ETV) (1) Any broadcast or closed-circuit television program which provides informational enrichment or peripheral enlightenment; (2) A generic term often applied to any television program related to some form of instruction. (See also INSTRUCTIONAL TELEVISION or ITV) (D & T Comm)

EFFECTIVE RADIATED POWER (ERP) The energy actually transmitted in the horizontal plane from the antenna of an FM or television station. (Lewis)

EFFECTS ANALYSIS The techniques of determining in objective and quantitative terms the effects of particular communications content on interpreters. Such analysis is always made after the interpreters have been exposed to the content. A variety of special techniques are used including information and attitude test, and interviewing. (Fearing)

EGRUL See RULEG

EIA (RETMA) STANDARDS A set of criteria and standards worked out by research committees to arrive at a working basis for commercial broadcast television equipment--both transmission and reception. The Electronics Industry Association (EIA), formerly known as RETMA, was responsible for activating this important work. Equipment not meeting EIA standards cannot be used for conventional telecasting purposes. (Lewis)

ELECTRIC BOARD A generic term applied to numerous devices created to test, drill or demonstrate; usually features an electrical circuit which activates a buzzer, bell, or light when appropriate contacts or switches are manipulated in response to questions or pictorial materials displayed on the board. Also called a "buzz board." (Brown) T-28

ELECTROMAGNET Device which becomes magnetized when connected to electric current (e.g., the tape recorder head is an electromagnet energized by the current passing through an amplifier from the microphone.) (USOE)

ELECTROMECHANICAL Refers to devices whose functions are accomplished by inter-related mechanical and electrical (or electronic) processes. Sometimes used to denote any of the audio or audiovisual components of electronic learning laboratory facilities, such as tape recorders, headphones, microphones, etc. (D & T Comm)

ELECTRONIC LEARNING LABORATORY Basically a series of tape recorders, earphones and microphones, connected by wire to a console where switches permit the instructor to communicate with (1) all students simultaneously, (2) groups of selected students, and (3) one student, individually.

The instructor may also distribute a single tape to all students or several, different master tapes to selected individuals. In some laboratories each student may have his own individual master tape to which he listens, orally responds and sometimes (according to instructions) records his oral responses. Most electronic laboratories place the tape recording mechanism at the student's desk. Each desk is isolated by sound dampened panels. In addition the student is provided with a microphone and earphones. Recently remotely controlled recorders, boom microphones fastened to the earphones headset along with the elimination of isolation panels have been installed to provide improved instruction. Supplemental studies demonstrate that greater efficiency is provided when visual materials are presented to either the entire group or to each student individually.

Experimentation since 1958 has provided evidence that these facilities can be utilized effectively for the teaching of foreign languages; reading; spelling, grammar and punctuation; music appreciation and criticism; English literature; social studies; stenography; and speech. (Oxhandler)

EMULSION The coating, consisting of gelatin and silver salts (unprocessed film) or gelatin and metallic silver (processed film) bonded to and supported by the film base. (UFPA)

ENCODING (1) Process whereby a message is transformed into signals that can be carried by a communication channel; (2) Process whereby a person transforms his intention into such behavior as can be a signal in a communication system. (The usual behaviors are oral or graphic language, but gestures, etc., may also serve. The entire encoding may involve several steps, e.g., a person writes out a telegram [first encoding] which is in turn transformed by another into electric signals [second encoding.]) (English)

ENLARGEMENT A print made from a smaller negative through a projection process. (D & T Comm)

ENTROPY The measure of unavailable energy in a thermo-dynamic system. By analogy, it refers to the information rate of a source of messages. Information tends to narrow the range of probability. In holding a direction opposite to that of randomness, information thus resembles negative entropy. (Adapted from Cherry and F. Allport by Knowlton)

ERASE (1) In tape recording, to remove the magnetic pattern on a tape by placing the tape in a strong magnetic field. On tape recorders, this is done by an "erase head." Tapes are also are also erased in a few moments on a "bulk eraser" (Brown); (2) In data processing, to destroy the information stored on the surface of a magnetic tape, magnetic drum, or cathode ray tube in order to make this storage space available for new information. (IBM)

ERASE HEAD See HEAD, ERASE

ERASER, BULK Device for erasing an entire reel of tape in a few seconds. It contains a powerful electromagnet which neutralizes the magnetic patterns on the tape. (USOE)

ERROR A response not acceptable to the programer. Programers attempt to eliminate errors by revising the program. Erroneous responses may indicate (1) A poorly designated item which fails to communicate and therefore needs to be rewritten; (2) A sequence in which prompts have been faded too fast or inadequate practice given; (3) Assumed previous knowledge which in fact the student does not have; (4) Poor analysis of the subject matter, leading to a confusion not predicted by the programer. T-30 Intrinsic programs handle errors by branching students to simpler presentations (type 2) or to remedial sequences (type 3). Linear programs are revised to prevent such errors. Errors due to sources (1) and (4) are unacceptable to programers and teachers alike.

Confusion has been introduced by assumptions that the principle of errorless learning means that all responses must meet a criterion of unvarying precision. "False starts" such as a blind alley in trouble-shooting or problem-solving, a tentative generalization based on inadequate data, an over-or under-estimation in approximation, etc., are "mistakes" which may be valuable for training purposes. (Markle)

ERROR RATE Generally, the percentage of incorrect responses on an item, a set of items, or a whole program. A relatively low error rate--and programers do not agree on the range that is "low"--is a necessary but by no means sufficient condition for a program to be considered acceptable. Spuriously low error rates are too easily attained by adding irrelevant easy items, testing with a pre-trained population, removing terminal items, etc. (Markle)

ETCHED GLASS Type of glass used for slide making which has one side etched or ground to give a milky or opalescent effect. (Kinder)

ETV See EDUCATIONAL TELEVISION

EXCITER LAMP An incandescent lamp to supply luminous energy to a photoresponsive cell, such as the photocell in a motion picture projector. Interposition of a variable mask or matte, such as a sound track, in the optical path between the exciter lamp and the photocell then results in corresponding variations in the electrical response of the photocell. (UFPA)

EXPOSURE Exposure is the process of subjecting a photographic film to any given intensity of light in such a manner that it may produce a latent image on the emulsion. (UFPA)

EXPOSURE METER Any of several types of optical or photoelectric equipment designed to assess reflected or incident light quantitatively. Most are equipped with an adjustable computer into which several pertinent values can be inserted, and from which the exposure required for a specific scene can be read. (UFPA) T-31

EYE LIGHT A special source of illumination designed to effect desirable reflection from the eyes and teeth of a subject without substantially affecting the over-all lighting condition. See also LIGHTING. (Lewis)

F

f-VALUE A system of rating lenses which states the relationship that exists between the lens opening and its focal length. It indicates the intensity of the light which strikes the film in the camera, and is written $f/ = F/d$, in which F is focal length and d is diameter of lens. (Kinder)

FACSIMILE An electronic system for transmitting pictures and graphic materials over very high frequency air waves. (Kinder)

FADER An electronic control that progressively decreases the intensity of an image picked up by a TV camera. This procedure can be continued until the image on the screen disappears entirely or the process can be reversed to fade in another image. (Lewis)

FADING The gradual removal of the prompts in a sequence of items teaching a particular topic. Sequences typically begin with highly prompted items and end with unprompted terminal items. The word is sometimes used as a synonym of vanishing. (Markle)

FAST FORWARD Tape movement control which permits fast winding of the tape to facilitate location of a specific portion which has not yet been played. The speed of this movement may vary considerably from one model recorder to another. (USOE)

FCC Abbreviation for Federal Communications Commission, a regulatory agency created by Congress in 1934. (D & T Comm)

FEEDBACK: (ELECTRICAL) Cumulative interaction between microphones and loudspeaker in the same audio circuit. Also, an electrical circuit arranged so that part of the power output is returned to the circuit at a lower level of amplification in order to improve the over-all performance of the amplifier. (UFPA)

FEEDBACK (COMMUNICATION THEORY) Refers to a fundamental property of any dynamic system, viz. the inter-dependence of parts. As one part of a system increases or decreases in some respect (such as speed) another part of the system with which it is dynamically inter-related, correspondingly changes its operation (e.g., speed). This later change, in turn, has effects on the former, etc. The system may be such that an increasing "output" so affects "input" as to in turn decrease "output" (negative feedback); or the opposite (positive feedback).

Feedback loops of concern are linguistic statements and expressive gestures--in fact anything that indicates to the communicator the manner in which the communicatee responds to his message; and anything that indicates to the interpreter the intent of the communicator in producing the message. (Knowlton)

FEEDBACK (PROGRAMING) A term borrowed from communication theory and used to describe some event which occurs as a result of or contingent upon the student's response. It is not necessarily synonymous with reinforcement, since it is not defined by its effect on the recurrence of the response.

In a trouble-shooting program, for instance, the response might be "I choose to measure A." Feedback would consist of "The value of A is X." The feedback does not indicate necessarily the rightness or wrongness of measuring A. (See KNOWLEDGE OF RESULTS.) A distinction is made by intrinsic programers between providing the student with the correct answer, as is typical in linear programs, and providing a more extensive discussion of why the answer is correct, as is sometimes done in intrinsic programs. The discussion is the feedback. (Markle)

FELTBOARD A type of display board made of cardboard or thin wood and covered with felt or similar cloth. Pictured symbols to be displayed on it are backed with similar materials and adhere to the feltboard. (When flannel is used, referred to as a "flannelboard.") (Cross)

T-33

FIDELITY Degree of the exactness or faithfulness with which any sound is duplicated or reproduced as compared to the original sound. (USOE)

FIELD In data processing, name given to the smallest completely significant piece or section of data. (IBM)

FIELD DISTRIBUTION In data processing, the spreading of data from one field to several for printing, punching, or accumulating in accordance with signals from the cards. (IBM)

FIELD SELECTION In data processing, the channeling of differing data locations into one field for printing, punching, or accumulation.

FILL LIGHTING See LIGHTING

FILM CHAIN An equipment arrangement in which one or more 16mm film projectors are directed in turn to provide image pickup for a television camera. This may include the projector, multiplexer, and TV camera. (Lewis)

FILM LOOP See CONTINUOUS LOOP

FILM NEGATIVE In photography, film which is used to receive the image photographed. In a negative, the image is in reverse from its normal appearance: dark subject areas are light or clear in the negative, and light subject areas are dark. The negative is later printed on positive film or paper. (Brown)

FILM, PANCHROMATIC Film that is sensitive to all colors of the visible spectrum. (Brown)

FILM, POSITIVE Film upon which images are reproduced for projection, and in which all their elements are presented in normal tonal relationships, as observed by the eye. (Brown)

FILM, REVERSAL A film, used in photography, which serves as both negative and positive. When the film is processed the negative image is reversed to become normal positive image for projection. (Brown)

FILM, SILENT A motion picture film on which no sound track T-34 has been recorded. Generally, silent film is 16mm and has sprocket holes on both edges. "Silent speed" for projection of 16mm is 16 frames per second. (Brown)

FILM, SOUND A motion picture film with self-contained sound track (optical or magnetic). A 16mm sound film has sprocket holes on one edge only. Projects properly at 24 frames per second. (Brown)

FILM, TRAINING A film produced with an instructional objective; may be synonymous with "educational" or "instructional" film. Sometimes conceived to be a film solely for instruction in skills. A military term for instructional films. (Brown)

FILMOGRAPH A "motion" picture made by photographing motionless subjects with motion picture camera. (Kinder)

FILMSTRIP (Also variously called "strip film" and "slide film") A length of 35mm or 16mm film containing a succession of still pictures, intended for projection one at a time in the same way as slides are shown. Some filmstrips are equipped with a tape or a recording that contains not only the narration but also a subsonic signal that activates a solenoid, thus advancing the filmstrip to the next picture on cue. (Gordon)

FILMSTRIP PROJECTOR Projection instrument designed to accept 35mm filmstrips, vertically if SINGLE FRAME or horizontally if DOUBLE FRAME: often equipped with an adapter to accept slides. Models available with manual advance and/or remote control. (D & T Comm)

FILMSTRIP, SOUND: See FILMSTRIP

FIXED FOCUS Of a lens, adjusted in manufacture to exhibit maximum depth of field, and permanently positioned relative to the film plane. Used chiefly on inexpensive amateur cameras. (UFPA)

FLANNELBOARD See FELTBOARD

FLANNELGRAPH See FELTBOARD

FLASH METER See TACHISTOSCOPE

FLAT PICTURE A flat picture is a representation, a visual likeness, of persons, places and things. It is a two-dimensional representation and may be an actual photograph or any one of the following: postcard, sketch, half-tone, print, lithograph, mural, cartoon, comics, poster, photograph. (Even maps, charts, and graphs are considered as pictures designed to show relationships.) (Cross)

FLAT RESPONSE Ability of an audio system to reproduce all tones (low and high) in their proper proportion. A sound system might be specified as having an essentially flat response, plus or minus two db. from 75 to 9,000 cycles per second. (USOE)

FLIP CHARTS An integrated easel graphic presentation that is hinged together into a unit. Their name came from the fact that you "flip" the separate sheets over the top of the unit into or out of view as you progress in the presentation. They are usually associated with tabletop presentation, rather than large audience groups. (ANA)

FLOCKING Term which comes from "flock," meaning small tufts of wool or hair, or wool refuse. In FELTBOARD use, flocking refers to a backing for cut-outs, usually a mass of flakes or fibres sprayed from a can or gun. These are usually synthetic flakes which stick to paper and will adhere to felt. (Kinder)

FLUORESCENT CHALK A type of chalk that becomes luminescent in a darkened room under special ultra-violet lighting. (Kinder)

FLUTTER Undesirable movement, in the recording of a picture or sound, which results in deterioration of the fidelity of the picture or sound record. In the case of pictures, this can occur during exposure of the film in the camera, during the printing process as the image is transferred from one piece of film to another, or in the projector while a print is shown on the screen. Flutter in sound may be variable, or it may be aperiodic, depending on its origin, which is usually the erratic or aperiodic irregularity of motion of some mechanical component involved in recording or reproducing the sound. See also WOW. (UFPA)

FM RADIO See RADIO, FM

FOCAL LENGTH For any thick lens, or combination of lens elements such as a photographic objective, the focal length is the distance from either principal focus to the corresponding principal point. The "principal points" are two positions on the optical axis, separated from each other by a distance variable with the characteristics of the individual lens or combination of lenses, and under ordinary conditions they coincide with the conjugate points for unit magnification, in this context being known as "nodal points." (UFPA) T-36

FOCUS The maximum definition of image attainable with a lens through adjustment of its optical relationship to the plane in which the image is formed. (UFPA)

FOIL Term used to refer to the sensitive plastic sheets used in ammonia-type printing. (Kinder)

FOOT CANDLE The illumination falling on a spherical surface one foot distant from a point light source of one standard candle intensity. Also expressed as the illumination on a surface one foot square when the uniformly distributed luminous flux has a value of one lumen. (UFPA)

FOOTAGE In the United States and some other countries, length of motion picture is usually expressed in the English system, with the foot as the basic unit. Width, or gauge, of film, however, is universally expressed in the metric system. (UFPA)

FORMAL PROMPT See PROMPT

FRAME An individual picture in a series of pictures, as in a motion picture film or filmstrip. (See ITEM.) (D & T Comm)

FRAME; DOUBLE See DOUBLE FRAME

FRAMER A button, lever, or knob that controls centering of frame of film in the aperture of a motion picture or filmstrip projector. (Brown)

FREQUENCY Pitch of sound as determined by the number of cycles per second. (USOE)

FREQUENCY MODULATION (FM) A high frequency radio wave in which the amplitude is kept constant and the vibrations fluctuate. FM usually means clearer, staticless radio; the sound waves travel in a straight line. (See also RADIO, FM) (Kinder)

FREQUENCY RANGE Range between the highest and lowest pitched sounds which a recorder or sound system can reproduce at a usable output, or volume level. (See also FREQUENCY RESPONSE.) (USOE)

FREQUENCY RESPONSE This is the output level of a recorder or sound system over a specific range of frequencies which is usually charted in the form of a curve. It is more specific than FREQUENCY RANGE and includes the plus or minus decibel rating which shows the "flatness." (USOE)

FRESNEL A special lens with concentric circle forms impressed in its front surface to focus spotlight beams for use in studio lighting. May be obtained in a variety of designs with restricted focusing from a 16° beam to a flood beam of 70°. (Lewis)

FULL-TRACK HEAD See HEAD, FULL-TRACK

FULL-TRACK TAPE See TAPE, FULL-TRACK

G

GAIN Ratio between the input and output levels of sound equipment. Gain is increased by means of an amplifier. (USOE)

GAP Minute distance between the poles of a recording head. The shorter the gap, the higher the frequency range of the recorder can be at a given tape speed. (USOE)

GATE, FILM A mechanism covering the film channel of a motion picture (or filmstrip) projector. The gate may be opened to insert or remove the film from the projector or clean the filmchannel, guides, pressure plate, and aperture. (Brown)

GLOSSY Applied to photographic papers that are specially coated to receive a high luster when dried. (D & T Comm)

GRAININESS In photography, a defect characterized by poor uniformity of color distribution, more or less in the pattern of small dots or grains, amplified by enlargement. (D & T Comm)

GRAPHIC COMMUNICATION The preparation, presentation and interpretation of static, two-dimensional, symbolic visual material. (The word "symbolic" is included to indicate that most graphics are representations of the original, and the presentation of the actual originals themselves.) (Langston)

GRAY SCALE (1) Variations in value from white, through shades of gray, to black on a television screen. The graduations approximate the tonal values of the original image picked up by the TV camera. Some systems are capable of producing a relatively high number of gradations in the gray scale, whereas others may be rather limited (Lewis); (2) A strip of paper or film which has a graduated series of tones from white to black. (D & T Comm)

GROUP PACING See PACING

H

HALF-TONE Method of simulating continuous tone by breaking an image into dots of equal density but variable area. (NABDC)

HEAD Small ring-shaped electromagnet across which the tape moves (in a tape recorder). This provides the energy which magnetizes the iron oxide coating on the tape into special patterns. (USOE)

HEAD ALIGNMENT See ALIGNMENT, HEAD

HEAD DEMAGNETIZER Hand-held electromagnet used to neutralize the unwanted residual magnetism built up and retained in recording heads. (USOE)

HEAD, DUAL-TRACK Head having two separate pole pieces each, each covering about half the width of the tape so that recording or playback of one or both channels (separately or concurrently) is accomplished with the tape moving in a single direction. Can be used for single-channel, dual-channel, or stereophonic recording. Also called two-track twin-track, or double-track. (USOE)

HEAD, ERASE Electromagnet which erases or rearranges any magnetic pattern on the tape before a new recording is made. (USOE)

HEAD, FULL-TRACK Head with a gap covering almost the entire width of the tape. Also a single-channel recorder. (USOE)

HEAD, HALF-TRACK Head which records and plays back about one-half of the width of the tape. It can be reversed to obtain use of the second half. This type is used for single-channel recorders. (USOE)

HEAD, PLAYBACK Electromagnet which converts the signal on the recorded tape into electrical impulses which are then amplified and reproduced as sound by a loudspeaker or headphones. (USOE)

HEAD, QUARTER-TRACK Head having two pole pieces which cover the first and third quarters of the tape. The second and fourth quarters are recorded by turning the tape over. Many stereophonic recorders now use this type. (USOE)

HEAD, RECORDING Electromagnet which converts the amplified audio information from the microphone into a succession of magnetic fields that rearrange the magnetic patterns of the iron oxide particles on the tape as it passes the gap. The same head is often used for playback. (USOE)

HEADPHONE (Also called "headset) A device consisting of one or two telephone receivers connected to a headband for individual listening to audio sources, such as intercommunication circuits. Some headsets or headphones are equipped with a small microphone to permit two-way communication. (Lewis)

HI-FI Common designation for "high fidelity"; refers to an instrument capable of reproducing both high and low sound frequencies. (Kinder)

HISS In a tape recorder, a noise which may originate in the amplifier or from the tape itself. Hiss will increase if heads are not demagnetized at intervals and will be recorded on the tape even during playback. (USOE)

HOPPER In data processing, the input receptical on the card feed of a machine. (IBM) T-40

HUE That quality of a color related to the wave-length of light which the color reflects. (NABDC)

HUM Low-pitch background noise caused by poor shielding or mismatching of impedances. It may be "60-cycle hum" picked up from a.c. electrical power wires. Three-pronged polarized plugs may also help prevent this. (USOE)

HUMAN ENGINEERING (1) An applied science, participated in jointly by psychologists and engineers, concerned with the design of equipment and the arranging of the physical conditions of work in relation to human sensory capacities, psychomotor abilities, learning capacities, body dimensions, comfort, safety, and satisfactions; (2) The art of managing men as the engineer manages materials. (English)

I

ICONIC SIGN A sign is iconic to the extent that it resembles or has the properties of the object, event or situation for which it is a sign. If the words "cat" and "meow" are both signs for the object cat, then, "meow" may be said to be more iconic than "cat." (Fearing)

ICONOGRAPHIC Term given to recent developments in the filmographic technique in which illusions of motion are created by camera, narrative, and music. (Kinder)

IMAGE ORTHICON A highly sensitive TV camera tube used extensively in studio cameras, as well as for field applications. (Lewis)

IMAGE REPRODUCTION The controlled visual recreation or duplication of an animate or inanimate process or material through a chemical, ultraviolet, mechanical, graphic, photographic, electronic, scanning, or other process; e.g., an overhead transparency, photograph, printed page, motion picture, radio facsimile, or television transmission. (D & T Comm) T-41

IMMEDIATE PLAYBACK New development in recorders for language learning which can play back each segment (variable lengths) of program-stimulus and student-response immediately or instantaneously after the student response without rewinding the tape or reversing its direction. (USOE)

IMPEDANCE Resistance in a circuit or component to the flow of alternating current which is rated in ohms. Output and input impedances of two or more connecting components must be matched quantitatively. Impedance is usually called "high" or "low." (USOE)

INCHES PER SECOND (I.P.S.) Tape speed is measured in inches per second $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$, 15 etc. (D & T Comm)

INDEX COUNTER See COUNTER, INDEX

INFORMATION (Information Theory) A purely quantitative property of an ensemble of items that enables categorization or classification of some or all of them. (English)

INFORMATION RETRIEVAL The process of storing large quantities of information and selectively retrieving this information under computer control. (IBM)

INFORMATION THEORY (1) An interdisciplinary study (not a theory) dealing with the transmission of MESSAGES or SIGNALS, or the communication of INFORMATION. (It draws upon COMMUNICATIONS THEORY--which includes much from physics and engineering, linguistics, psychology, and sociology) (English); (2) The study of the communication process in all its aspects. It is a body of mathematical results concerning a quantity called INFORMATION which is a measure of the amount of knowledge contained in a proposition or a message. (IBM)

INPUT (COMMUNICATIONS THEORY) The energy entering a system from without; in a communications system, that which acts on a receiver. (English)

INPUT (ELECTRICAL) Connecting device, such as a jack, which carries the incoming signal. Also the incoming signal itself. (USOE)

INPUT (DATA PROCESSING Any data in any of several possible forms which is introduced into and acted upon by the calculator to produce a particular result. (IBM)

INSTRUCTION In data processing, the name given to the coded group of characters recognized by the calculator to perform any specific operation. Composed of two groups, an operation code (what is to be done) and an address (where reference is to be made in memory). (IBM)

INSTRUCTIONAL AIDS Devices which are used simply to assist an instructor in the teaching-learning process by presenting supporting or supplementary material, usually intermittently. They are not self-supporting. (See also INSTRUCTIONAL MEDIA.) (D & T Comm)

INSTRUCTIONAL MEDIA Devices which present a complete body of information, and are largely self-supporting rather than supplementary in the teaching-learning process. (Also see INSTRUCTIONAL AIDS.) (D & T Comm)

INSTRUCTIONAL TELEVISION OR ITV Any closed-circuit or broadcast television program which provides formal instruction, usually for credit. (See also EDUCATIONAL TELEVISION OR ETV.) (D & T Comm)

INTERCOMMUNICATION SYSTEM Usually a two-way "intercom" audio network which permits "talk-back" between the teacher and student in an electronic learning laboratory or remote classrooms on a closed TV circuit, also audio connection between a TV or radio director and crew members. (D & T Comm)

INTERPRET A machine operation to convert the punched data in a card to one of two printed lines (or both) on the face of the card. (IBM)

IONOSPHERE An outer belt of the earth's atmosphere which is ionized or electrically excited by radiations from the sun or interstellar space; varies in height from several hundred miles high during the day to 25-50 miles after sunset. Reflects lower frequency radio waves such as standard AM or shortwave back toward the earth and thus extends broadcast coverage increasingly as it lowers. (D & T Comm)

I.P.S. See INCHES PER SECOND

IRIS An adjustable diaphragm, usually incorporated in the structure of a lens barrel, designed to control the amount of light passing through a lens. Ordinarily made up of a series of interlocking leaves, the iris opening is usually set up to be accurately concentric with the optical axis of the lens, and is calibrated in terms of f-stops or t-stops. (UFPA)

ITEM A segment of material which the student handles at one time. Items vary in size from a single incomplete sentence, question, or instruction to perform some response up to sizable paragraphs. In almost all programing methods, it will require at least one response and provide for knowledge of results before the student proceeds to the next item. (Markle)

ITV See INSTRUCTIONAL TELEVISION

J

JACK Receptacle for a plug connector which leads to the input or output circuit of a tape recorder or other audio device. Standard phone plugs and jacks are used in most language laboratory systems. Special jack boxes afford several outlets so that several headphones may be plugged in together. (USOE)

K

KEY LIGHT See LIGHTING

KEYSTONE EFFECT An out-of-square image on a projection screen, resulting when the plane of the screen and the plane of the projected material are not parallel to each other. (Brown)

KILOCYCLE A measurement unit equal to 1,000 cycles per second and used to express the frequency of radio and other electromagnetic waves. (Lewis)

T-44

KINESCOPE The kinescope is the picture tube of a television receiver. However, recently the term has been applied to motion picture films made by photographing the images produced on the "kinescope," or picture tube. (Cross)

KIT A collection of pertinent materials gathered and integrated into an instructional unit, e.g., a textbook, filmstrips, tape recording, integrated into one basic unit. (For more recent and complex applications of this concept, see SYSTEMS APPROACH and SYSTEMS DESIGN.) (D & T Comm)

KNOWLEDGE OF RESULTS A report to a student on the status of the response he made. It may take the form of a verbal report "Right" or "Wrong" (or lights, buzzers, etc., signaling these), or a display (oral or written) of the correct verbal response. It may be a response of a manipulandum, particularly in those cases in which the operation of a device is the subject matter. Some teaching machines advance to the next item only when the correct response has been given. Since knowledge of results has been shown to facilitate learning in many situations, it is generally considered a sub-class of reinforcement. (Markle)

L

LANGUAGE A set of symbols whose "meanings" are shared by or common to the group of interpreters whose language it is. The symbols are producible by the interpreters and are formally combinable in some ways and not in others (grammar). Language appears only in a social context. (Fearing)

LANGUAGE LABORATORY A term currently used to describe a room equipped for language instruction in which tape recorders, projectors, record players, and other devices are used singly or in combination. (See ELECTRONIC LEARNING LABORATORY) (Brown)

LANTERN SLIDE Mounted 3¼" × 4" (and occasionally 2¼" × 2¼") slide, often glass enclosed, which may be handmade with pencil, crayon or inks, or typed on special materials or photographically processed. Their larger transparent surfaces (see ETCHED GLASS) have made lantern slides the most popular teacher-student produced projection medium until the advent of the overhead TRANSPARENCY. (D & T Comm)

LANTERN SLIDE PROJECTOR Projection instrument designed to accept standard 3¼" 4" lantern slides, and occasionally 2¼" 2¼" slides, with the provision of a special adapter. This projector, still popular, was the forerunner of the SLIDE PROJECTOR AND FILMSTRIP PROJECTOR. (D & T Comm)

LAYOUT Visualized plan for a display, poster, bulletin board, publication, or chalkboard presentation. Usually done to scale and with sufficient detail to indicate how the final product will appear. (Brown)

LEADER The extremities of a roll or reel of motion-picture film are called "leaders" or "protective leaders." Leader stock also is used in negative cutting to maintain synchronization between succeeding scenes in the A-roll, the B-roll, etc. Stock usually is opaque, either coated or exposed black-and-white film, which may be either dark (exposed to light) or clear. Leader stock is used in developing machines to maintain continuity of the film patch through the various baths and dryers. (See also ACADEMY LEADER.) (Gordon)

LEARNING A change in the stable relationship between (1) a stimulus that the individual organism perceives and (2)a response that the organism makes, either covertly or overtly. (Berlo)

LENS (1) In optics, any transparent system by which images may be formed through the light-refracting properties of curved surfaces. Photographic objectives usually are made up of a number of individual units, each having a combination of positive and/or negative spherical section surfaces. In some instances the unit combination includes a neutral, or plane surface. The several units are mounted in a specific relationship to each other in a cylindrical mounting, or barrel, which usually also includes an iris diaphragm with it, calibrated external scale, and a mechanical device to permit focusing. Glass of appropriate index of refraction is used for each of the unit elements, some combinations of which may be cemented together with an optical cement such as Canada Balsam. Other combinations may be related by an air space, as dictated by the demands of the specific lens design; (2) Commonly, any optical system complete with barrel, focusing ring, etc. (UFPA)

LENS, ANAMORPHIC See ANAMORPHIC LENS

LENS, CONDENSING See CONDENSING LENS

LENS SPEED Refers to the ability of a lens to pass light. A fast lens would be rate f/1.4; a much slower lens might be designated as f/8. The larger the f/number the slower the lens. (See also f-VALUE) (Lewis)

LENS TURRET See TURRET

LENTICULAR SCREEN A silver projection screen with tiny corrugations on its surface to increase the brilliance of the image. (D & T Comm)

LEVEL INDICATOR Device on the tape recorder to indicate the relative level at which the recording is being made, and to serve as a warning against under-recording or over-recording. It may be a neon bulb, a magic eye, or a VU meter. (USOE)

LIBRARY (INFORMATION CENTER, AV CENTER, INSTRUCTIONAL MATERIALS CENTER) A function whose responsibility is to systematically collect and acquire information, classify it, store it and, upon demand, retrieve it and assist in adapting it to the use to be made of the information. (TerLouw)

LIGHT CONTROL A term used by architects to identify methods of regulating light from sources outside a room. In audio-visual terminology, light control, in addition, includes the features by which rooms are darkened for projection. For clarification, it is recommended that both terms, "light control" and "room darkening" be used. (Brown)

LIGHT METER A device incorporating a photocell connected to a calibrated meter to read directly in foot candles. Used to check light levels in a scene or set to be televised or photographed. (D & T Comm)

LIGHTING (1) The condition or state of being lighted, or the means or technique of illuminating. In motion picture photography (or TV), the illumination of the action field; (2) Back lighting: lighting the subject from the side opposite the camera to provide a limning effect which helps to separate the subject from the background; (3) Cross lighting: lighting from an angle approaching perpendicularity with the lens axis. Used for modeling and to emphasize texture; (4) Fill lighting: lighting used to illuminate shadow areas resulting from the main, or key light source; (5) Key lighting: lighting on the subject received from the main, or dominant light source; (6) Highlighting: lighting to emphasize the central point of interest of a scene. (See also BASE LIGHT, EYE LIGHT, SPOTLIGHT.) (UFPA)

LINE-OF-SIGHT A term popularly employed to describe transmission characteristics of UHF television channels and other high-frequency bands (such as FM). Such frequencies are usually limited in transmission range by straight-line distances between the radiating antenna and the receiving antenna. Natural or man-made obstructions existing between the sending and receiving positions further limit coverage. (Lewis)

LINE PRINTER In data processing, a printer mechanism that prints complete multi-character lines of printing, one after the other. (IBM)

LIP-SYNC The production of a film or kinescope with recorded sound track that is synchronized with the spoken words of the person or persons involved in the film. Films that do not incorporate lip sync might have a narrator's voice recorded on the film. (Lewis)

"LIVE" PROGRAMS Programs which are broadcast at the point and time of origin. (Kinder)

LOGIC The process of determining by deductive reasoning, the means for obtaining a desired result from a given set of conditions. (IBM)

LOGIC DEVICE Mechanical or electronic device which can perform any one of the 16 basic logical functions. Has two stable states--either on or off--a decision element. (IBM)

LONG PLAYING Usually abbreviated LP. A term applied to records with close or fine microgrooves. These records usually play at $33\frac{1}{3}$ or 45 r.p.m. instead of 78 r.p.m. (Kinder)

LOOP In motion picture projection, the word "loop" refers to a slack portion of the film immediately above and below the "gate" area; permits the film to move intermittently without being damaged. (Brown) T-48

LOW-POWER TELECASTING Under amended rules of the FCC, TV stations can now be operated with as little as 100 watts of effective radiated power. Prior to this ruling the minimum ERP was 1000 watts. (Lewis)

LS (LONG SHOT) See SHOT

M

MACHINE PACING See PACING

MACHINE PROGRAM A sequence of step-by-step operations which is to be performed by the computer in order to solve a problem. (IBM)

MAGAZINE A container for film, tape, slides or filmstrips, usually embodying a transport mechanism, designed to supply or present the material for controlled exposure. Most magazines are built to integrate with specific equipment, with drive mechanisms mechanically coupled. (D & T Comm)

MAGNETIC BOARD A sheet of metal to which objects may be attached by means of magnets. This same surface may be coated with paint or enamel and used as a chalkboard. (See also CHALKBOARD.) (Cross)

MAGNETIC CORES Powdered magnetic oxides pressed into the shape of doughnuts and capable of being magnetized in either of the two circumferential directions. Those used in computer storage units are about the diameter of a pencil lead. (IBM)

MAGNETIC FILM A sprocketed synchronous acetate base with a magnetic coating that is available from stock in 35, 17½, 16, and 8mm sizes. Characteristically, the film resembles the commonly known ¼" tape varieties, but through the use of sprockets it can be synchronized exactly to the film. (Gordon)

MAGNETIC SOUND Sound which has been recorded on iron oxide coated film or tape by an electronic magnetic process. (Kinder)

MAGNETIC SOUND PROJECTOR A motion picture projector capable of showing motion picture film which has either an optic or magnetic sound track. (Kinder)

MAGNETIC TAPE An acetate or plastic ribbon coated on one surface with tiny iron oxide particles. The ¼" width tape is ordinarily employed for magnetically recording audio for subsequent reproduction. Special tapes of greater width are used for magnetic storage of data in computers. The most recent development is the 2" width used in video tape recording the entire television program, including the audio, video, and synchronizing and control signals. (Lewis)

MARK SENSE (PARALLEL PUNCHES) The sensing of discretely placed graphite marks on a card to cause the punching of the market data. (IBM)

MASK In photography, a mask is a frame of cardboard or other substance used to confine the picture area of slides or transparencies, and to give support to the projection material in the slide. (Brown)

MASKING Protecting part of a light-sensitive layer by an opaque shield during part of an exposure. (NABDC)

MASS MEDIA The instruments of communication that reach large numbers of people at once with a common message: books, magazines, television, radio, motion pictures, etc. (English)

MASTER Term used to designate a device which has control over several others or produces the original taped material. Often applied to tape, program, console, switch, duplicator, etc. The term "slave" is used sometimes to designate another device controlled by a "master." (USOE)

MASTER ANTENNA SYSTEM An arrangement designed to eliminate need for individual antennas for each television receiver. Antennas are arranged to pick up television signals in a given service area and are connected to an amplification and distribution network to provide optimum signals to multiple locations within one or more buildings. (Lewis)

MASTER CARD A punched card storage means for common data that has frequent use. (IBM)

MASTER TAPE The tape recording from which duplicates are made. Frequently valuable "master tapes" are copies on metal disc records to insure the recorded material against loss due to fire or accidental exposure of the master tape to strong magnetic fields. (Cross)

MATTE FINISH Dull, gloss-free surface finish. (NABDC)

MATTE SCREEN Projection screen with flat, even surface and dull finish which provides an even brilliance at all viewing angles; most effective in well-darkened viewing areas. (D & T Comm)

MCU (MEDIUM CLOSE-UP) See SHOT

MEDIA, INSTRUCTIONAL See INSTRUCTIONAL MEDIA

MEDIATOR In communication theory the system that intervenes between the receiver and the transmitter. It combines the function of destination and source. (English)

MEGACYCLE A unit equal to 1,000,000 cycles per second; used to express the frequency of radio, television, and other electromagnetic waves. One megacycle is equal to 1,000 kilocycles. (Lewis)

MEMORY Shortened name for storage devices locations in general. The name doesn't imply any particular device as much as it implies storage of some data where it will be accessible when needed. (IBM)

MEMORY DRUM A mechanical device for the serial presentation of memoranda for regulated periods and at regulated intervals. (English)

MEMORY FILE A large bank of memory cores where information is stored. (IBM)

MERGE (COLLATOR) The filing together of two decks of cards in the same sequenced order. (IBM)

MESSAGE In communication theory, an ordered selection from an agreed set of signs intended to communicate information. Cherry)

MICROCARD A card on which a large volume of printed materials has been condensed to extremely small size by photographic processes. Microcard material is read with the aid of a microcard reader, which magnifies the minute writing. (Cross)

MICROFILM Film upon which, by photographic processes, printed and other materials are reproduced. The minute images on the film are observed through a special magnifying viewer or by projection. (See MICROFILM READER.) (Brown)

MICROFILM READER Apparatus with a built-in screen or viewing glass arranged to magnify microfilm so that it can be read comfortably at eye distances and without the use of hand magnifying glasses. (Kinder)

MICROGROOVE Literally means "fine grooving." On the standard 78 r.p.m. disc, grooves are spaced so that between 80 and 120 lines are accommodated to an inch. On the microgroove record, 350 lines per inch are considered the minimum. (Kinder)

MICROPHONE A device employed to pick up sound frequencies and to convert them to electrical variations for transmission on electrical cables. Microphones are available in a variety of designs and pickup or directional patterns. Accessories permit the use of booms, stands and clips as supporting and manipulating arrangements. (Lewis)

MICROPHOTOGRAPHY Still or motion picture photography of minute objects through the lens system of a microscope. (D & T Comm)

MICROPROJECTOR A special projector designed to enlarge and project microscopic transparencies (such as microscope slides or sections of microfilms for viewing by whole classes or even large audiences. (Cross)

MICROWAVE Transmission of electrical signals through super-high frequencies. (D & T Comm)

MICROWAVE RELAY A series of high-frequency directional transmitters and receivers strategically spaced to permit the successive reception and retransmission of radio and television signals through space between widely separated points. (Lewis)

MIL One-thousandth of an inch. Tape thickness is usually measured in mils. (USOE)

MIX To combine sound from two or more sources into a single recording (or output), usually with adjustment of tonal quality and/or relative volume level. (UFPA) T-52

MIXER Device which permits the combining of two or more input signals at the same time into a recorder or audio system at the level desired. (USOE)

MLS (MEDIUM-LONG SHOT) See SHOT

MOBILE UNIT A truck or trailer equipped with television or radio units to permit the pickup of programs in the field. Some units are equipped with microwave facilities to communicate with the home-base station; other arrangements comprise a mobile studio. (D & T Comm)

MOCK-UP A representation of the real thing, constructed so as to emphasize the particular part or function of the real thing. It may be smaller or larger than the original; certain features may be made so as to give emphasis to functions or relationships. (Cross)

MODEL (1) The voice or voices, preferably of native speakers, which are recorded as a guide for student practice. Also the utterances or basic material of each lesson which appear in dialogue form, narrative form, or in isolation and are used as models for the students. (USOE) (2) A scale replica or representation of reality. The scale may be miniature, exact size, or enlargement, and the model itself may or may not be manipulative. (Cross)

MONAURAL Recording or audio presentation with one or more microphones but which is recorded or broadcast on only one track. (D & T Comm)

MONITOR A high-definition TV viewer connected directly to the camera output. A true monitor does not incorporate channel selector components or audio components. In some closed-circuit applications, monitors are used where high definition in the reproduced image is necessary. (Lewis)

MONITORING In electronic learning labs, listening to the sound signal as it is being recorded or played back. A separate playback head on some recorders, permits listening to the tape as the recording is made. Also listening to students through the intercom during listen-speak practice or during record and playback of student practice responses. (USOE)

MONTAGE In motion picture editing, the technique of cutting together a number of scenes that are either joined by straight cuts or dissolves to give an over-all impression; also refers to the printing of several scenes together in the same composition by the use of traveling mattes and an optical printer. (Gordon)

MULTI-MEDIA APPROACH See CROSS MEDIA APPROACH

MULTIPLEXING See SIGNAL MULTIPLEXING

MULTISENSORY Pertaining to more than one of the human senses. (D & T Comm)

N

NARTB CURVE Standardized playback equalization curve set by the National Association of Radio and Television Broadcasters (the National Association of Broadcasters). (USOE)

NEGATIVE See FILM, NEGATIVE

NITRATE FILM Cellulose nitrate or celluloid film; a highly inflammable plastic used as the base of theatrical motion picture film, and in earlier years, on 16mm educational films. (See also ACETATE FILM.) (D & T Comm)

NOISE (1) Disturbances which do not represent any part of the messages from a specified source. (Cherry) (2) Anything that introduces extraneous variability into a communication process or that raises the entropy or reduces the information--i.e., difference between input and output generated by random error in the communication system itself. (English)

O

OBJECTIVE LENS The lens or system of lenses which forms the primary image in an optical system. (D & T Comm)

OHM Practical unit of electrical resistance, being the resistance of a circuit in which a potential difference of one volt produced a current of one ampere. (USOE)

OPACITY The ratio between the amount of light incident upon a transparent surface and the amount of light transmitted by that surface. Opacity is the reciprocal of transmission, and its log is equal to density. (UFPA)

OPAQUE That property of being impervious to light and non-transparent. (NABDC)

OPAQUE PROJECTOR A projector which can project small opaque images, such as maps, pictures, or printed pages, onto a screen as enlargements. (Kinder)

OPEN-CIRCUIT Refers to broadcast situations where programs are radiated for reception by any listener or viewer within range of the station. Applies to commercial and educational television and radio stations. (Lewis)

OPTICAL SCANNER In data processing, the electronic process of "reading" or recognizing written symbols by reflecting light from the written page through an optical system to a light sensitive device. This device converts the reflected energy into electrical impulses which may be transmitted as a digital representation of the information on the written page. (IBM)

OPTICAL SOUND Sound which has been recorded and/or printed on photographic film by exposing and processing the light-sensitive sound track area. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Kinder)

ORTHOCHROMATIC FILM A film sensitive to ultraviolet, blue and green, but not red colors. (Kinder)

OSCILLOSCOPE A test instrument, similar in some respects to a television receiver, that shows visual patterns of voltage and current characteristics. (Lewis)

OUTPUT (DATA PROCESSING) Any media which contains the finished product (or partially finished product) of a calculating machine process. (IBM)

OUTPUT (COMMUNICATIONS THEORY) The signal emitted by a source; in the case of an animal, overt behavior which acts as a signal for another animal or which acts upon a nonliving communication system. (English)

OUTPUT (ELECTRONIC) Signal delivered from any audio device; also a jack or connector which feeds the signal to another piece of equipment. (USOE)

OVERHEAD PROJECTOR A projector which throws a highly-illuminated image on the screen by reflection from a mirror; it is placed in front of the audience and may be used in a semi-darkened or completely lighted room; utilizes 3¼" × 4", 7" × 7", and 10" × 10" transparencies and specially prepared objects which may be produced and presented in a variety of ways. (D & T Comm)

OVERLAY Group of transparent or translucent prints used to form a composite print or slide. (NABDC)

OVERLOAD More volume than can be handled adequately without distortion in audio equipment. (D & T Comm)

P

P.A. See PUBLIC ADDRESS SYSTEM

PACING The rate at which the student proceeds through a given number of items. The usual procedure in programed instruction is SELF-PACING: the student reads and responds at his own rate. A stimulus device such as a film may be adapted to perform stimulus-response functions. If materials are presented by such a device to a group, the time allowed for input and for response has to be standardized, resulting in GROUP-PACING. A few devices, such as reading accelerators, control the individual students pace by MACHING-PACING, moving on to the next item irrespective of the student's behavior. (Markle)

PAN See SHOT

PANCHROMATIC FILM See FILM, PANCHROMATIC

PANEL A section of material available to the student while working through more than one item. The term has been used to include texts, diagrams, maps, globes, and laboratory equipment, any of which may be incorporated into a program. In discussions of programed textbooks, the term PANEL is used to refer to a single level in the horizontal format. Thus, such a text might be said to have three "panels" on a page--levels A, B, and C. (Markle)

PAN-TILT HANDLE An extension rod attached to a camera mount to enable the cameraman to pan or tilt the camera manually. (Lewis)

PANTOGRAPH (GRAPHICS) For mechanical duplication of drawings or designs in enlarged or reduced scale. (Brown)

PANTOGRAPH (LIGHTING) A light-fixture suspension device with provision for raising and lowering the light source; unit extends or contracts in much the same way as an accordion. (Lewis)

PARALLAX The apparent displacement of an object in relation to its background due to observation of the object from more than one point in space. In camera work the viewfinder often is mounted with its optical axis at an appreciable distance from the optical axis of the camera lens, commonly resulting in inadvertent positional errors in framing, due to parallax. In more elaborate cameras a special mechanical arrangement permits using the viewfinder with its optical axis coincident with that of the camera lens, thus effectively eliminating this error. (UFPA)

PATCH CORD Connecting cable with a plug on each end for conveniently connecting two pieces of audio equipment. (USOE)

PATTERN DRILL Exercise with basic or model utterances in which several small and consistent changes in sound, form, order, and vocabulary are made repeatedly in order to gain control over the specific grammatical (or other) structure involved. (USOE)

PERCEPTUAL LEARNING Learning which results from direct contact through the senses. (Kinder)

PERSISTENCE OF VISION A time-lag effect between visual stimulation of the eye and cessation of response to that stimulation. For any intermittently illuminated source there is a critical frequency (which depends on the brightness of the source) above which the average eye can detect no sensation of flicker. With the average screen illumination used in motion pictures, this critical frequency is approximately sixteen such intermissions per second for the average eye, and rates above this frequency appear to be continuous. (UFPA)

PHOTOCOPYING A process whereby duplicate copies of hand-drawn or printed materials, including pictures, are made by automatic photocopying machines. (Kinder)

PHOTOELECTRIC CELL A small device designed to generate minute electrical currents when exposed to light. In sound motion picture projectors, the cell reacts to the light from the EXCITER LAMP. (Cross)

PHOTOGRAM A picture taken on photographic paper, but without the aid of a camera. (Kinder)

PHOTOMICROGRAPHY Same as MICROPHOTOGRAPHY

PHOTOPLAY A motion picture made from a play or drama, such as "Richard III" or "Helen of Troy." The term has been used loosely to include almost any major "Class A" motion picture production. (Kinder)

PHOTOSCOPIC MEMORIES A glass disk on which information is stored photographically in binary form. This information can be read out by a beam of light. It is presently being used in language translation. (IBM)

PHOTOSTAT Trade name of a camera which makes copies of documents, letters, drawings, etc., on sensitized paper; also the generic term for copies made by means of this or a similar camera. (See also PHOTOCOPYING.) (D & T Comm)

PICKUP A term sometimes applied loosely to the tone arm and cartridge of a phonograph. A cartridge, especially containing the stylus (needle) and sensitive component for creating electric current. (Brown)

PLATEN The flat surface or platform in the opaque projector on which materials to be projected are placed. (D & T Comm)

PLAYBACK Expression used to denote reproduction of the sound previously recorded. (USOE)

PLAYBACK HEAD See HEAD, PLAYBACK

POLARIZED PROJECTION See STILL MOTION SLIDES

POSITIVE FILM See FILM, POSITIVE

POSITIVE IMAGE A positive image is a photographic replica in which the values of light and shade of the original photographed subject are represented in the natural order. In the case of color film, the positive image also represents each color of the original photographed subject in the natural order tonal range as it appears in the subject. (UFPA) T-58

PREAMPLIFIER Amplifier designed to raise very weak signals, such as those from a microphone or magnetic head, to a voltage level high enough for a power amplifier. (USOE)

PRESSEY DEVICE A multiple-choice device dating from the 1920's. Questions were presented either on a rotating drum or on separate sheets. The student selected an alternative and pressed a corresponding key. The machine was coded so that, if the student's response was correct, the device advanced to the next question; if the response was incorrect, an error was tallied and the device remained set for the question until the correct response was given. (Markle)

PRESSURE PADS Small felt pads mounted on spring-brass arms which hold the tape in close contact with the heads during record and playback. (USOE)

PRESSURE ROLLER Rubber-tired roller which holds the tape tightly against the capstan to insure constant tape speed and prevent slippage. (USOE)

PRINT or POSITIVE These terms are used to designate any of the following: (1) The raw stock specifically designed for positive images; (2) The positive image; (3) Positive raw stock which has been exposed but has not been processed; (4) Film bearing a positive image which has been processed. (UFPA)

PRINT THROUGH In tape recording, transfer of the magnetic field from layer to layer of tape on the reel during storage resulting in "echo" sounds on portions of the tape. (USOE)

PRINTING Making positives from a negative either by contact or by projection. (D & T Comm)

PROCESSING, DATA See DATA PROCESSING

PROGRAM A sequence of carefully constructed items leading the student to mastery of a subject with minimal error. The distinguishing characteristic of programed materials is the testing procedure to which they are subjected. Empirical evidence of the effectiveness of each teaching sequence is obtainable from the performance records of students. (See PROGRAMING, LINEAR and PROGRAMING, INTRINSIC.) (Markle)

PROGRAMED INSTRUCTION The utilization of programed materials in achieving educational objectives. Synonymous with "auto-instruction, automated teaching," etc. (Markle)

PROGRAMED TEXT A book in which a program is printed. There are two typical formats: page-to-page and down-the-page. In a page-to-page text, the student turns the page after each item, finding the answer and the next item on the following page. Generally, items are arranged in levels. The student goes through the book doing all the items on one level, then repeats the process for each successive level. In a down-the-page format, the student is required to mask the answer column and in some cases, everything but the item he is working on as he reads down the page. The term "programed text" almost always refers to a linear program. (See SCRAMBLED BOOK.) (Markle)

PROGRAMER (COMPUTER) Individual who prepares instruction sequences and who develops the step-by-step operations which are to be performed by the computer in order to solve a problem. (IBM)

PROGRAMER (PROGRAMED INSTRUCTION) The person responsible for the design of items and sequences in a program. The programer may be a psychologist working with a subject-matter expert who delineates the content, or he may be a subject-matter specialist trained in programing techniques. (Markle)

PROGRAMING, "ELECTIC" A term for those programers not committed to a particular school of programing. The resulting programs may contain ruleg and egrul sequences, multiple-choice and constructed-response items, branches and linear sequences. (Markle)

PROGRAMING, INTRINSIC A programing technique developed by Norman Crowder, characterized by relatively lengthy items, multiple-choice responses, and consistent use of branching. If, after reading the information section of each item, the student selects the correct response to the question based on the material, he is sent to an item presenting new information. If he selects an incorrect alternative, he is sent to an item which provides information as to why his choice was incorrect. To the extent that the programer has correctly predicted the possible response that the student population will make, the program taken by each student is under the control of his own responses, and will differ for students of differing abilities. (Markle)

PROGRAMING, LINEAR A technique of programing developed by B. F. Skinner. Set sequences of items present information in small units and require a response from the student at each step. The steps are so designed that errors will be minimal for even the slower students in the target population. Every student does each item in the program, his progress differing only in the rate at which he proceeds through the sequence. Constructed responses are demanded of the student most of the time. (Markle)

PROJECTION, REAR-SCREEN See REAR-SCREEN PROJECTION

PROMPT A stimulus added to the terminal stimulus to make the correct response more likely while the student is learning. It may be pictorial or verbal. Prompts vary in strength, i.e., in the probability with which they will evoke the correct response from a given population. The term is used synonymously with CUE and is generally synonymous with the non-technical term "hint." Prompts were classified by Skinner into two major types; FORMAL PROMPTS provide knowledge about the form of the expected response, such as the number of letters, the initial letter, or the sound pattern (prompted by a rhyme); THEMATIC PROMPTS depend on meaningful associations which make the student likely to "come up with" the expected response.

A distinction between PROMPT and CUE is made by some writers. The term "prompt" is used to describe the function of a model of the response which the student copies, while a cue is a hint of a weaker sort. (Skinner specifically excluded from the category "prompt" stimuli to be imitated.) This usage of the term parallels the laboratory technique of RESPONSE PROMPTING, in which a student is given a stimulus (a word or picture), is told the correct response ("prompted"), and repeats the response after the prompter. Note: since one use of the term specifically excludes that which the other use of the term includes, readers must determine which sense the author intends before interpreting one set of results as being in conflict with another. (Markle)

PSYCHOLINGUISTICS The study of the relations between communications or messages and the characteristics of the persons who communicate; specifically, the study of language as related to the general or individual characteristics of the users of language. (English)

PUBLIC ADDRESS SYSTEM Often abbreviated "P.A." An audio system for amplifying sounds of speech or music, usually composed of one or more microphones, an amplifier, and one or more loudspeakers. Some amplifiers are capable of accepting and amplifying music from tape recorders, phonographs, or radios. (Brown)

Q

QUARTER-TRACK HEAD See HEAD, QUARTER-TRACK

R

RADIO, AM Radio transmission on wavelengths between 550 and 1,600 kilocycles. AM stands for "amplitude modulation," a procedure for transmission of radio signals usually used on the bands mentioned. Most widely used radio broadcast system in the United States. (See also AMPLITUDE MODULATION.) (Brown)

RADIO, FM Radio bands from 88 to 108 megacycles, using a particular kind of propagation and transmission of radio signals. FM represents "frequency modulation." FM is characterized by high-quality, noise-free transmission. Television sound also is broadcast by FM transmission. (See also FREQUENCY MODULATION.) (Brown)

RADIO FREQUENCY Part of the electromagnetic spectrum where bands of frequencies, or channels, are allocated for radio and television use. (Lewis)

RANDOM ACCESS The name applied to the ability to go to any storage location at any time and with equal facility and get a piece of information. Access time is a further consideration. (IBM) T-62

RATE See PACING

READ-OUT The operation of sensing and/or perceiving the DISPLAY. It is used either as a noun or verb. Read-out can be an activity of an individual or a group. In the case of the group it can be simultaneous or distributed in time. Another variable is the special distribution of the group (all together or scattered in small groups in many locations). Task involvement during read-out is another consideration; act of responding to a DISPLAY by identifying information content and interpreting its significance. (TerLouw)

REAR-SCREEN PROJECTION The projector, located behind a translucent screen, is placed in front of the viewers. May be housed in a self-contained unit or in a projection room. A mirror system adapted to the projector reverses the image from left to right. (Also referred to as "indirect projection" since the mirror system bends the projection beam.) (D & T Comm)

RECEIVER (BROADCAST) Electronic instrument whose antenna intercepts the carrier wave of a radio or TV station to which it is tuned, amplifies the signal, and translates the electrical energy into sound and, where applicable, picture. (D & T Comm)

RECEIVER (COMMUNICATIONS THEORY) That which transforms a signal into a message. (English)

RECEIVER, "JEEPED" (TELEVISION) A regular receiver that has been modified to permit it to be used as a monitor for direct-video purposes in a closed-circuit system. This is accomplished through by-passing most of the circuit elements and feeding the picture signals directly into the video amplifier. When this is done, it is necessary to provide a separate audio source. Some receivers on the market can be used conventionally or "jeeped" according to need. (Lewis)

RECEIVER, PROJECTION (TELEVISION) A television set with a small but high-intensity picture tube. The tube operates through an optical system to project images which are viewed on a screen. Some recent developments employ different approaches to achieve this effect. (Lewis)

RECORDER, DISK A device for reproducing sound on disks surfaced with acetate, or other plastic substance, in which grooves may be cut containing the physical representation of vibrations created by sound. A stylus vibrates to cut the signal and the groove. (Brown)

RECORDER, FILM A device for recording sound on film by photographic process. (Brown)

RECORDER, TAPE A tape unit, sometimes called a recorder/reproducer, which can record and play back. It contains recording and playback amplifiers and heads. The heads may be full-track, half-track, dual-track, or quarter-track. (USOE)

RECORDER, VIDEO-TAPE A device capable of recording both the audio and video signals of a television production on a special magnetic tape, which can be played back to reproduce the entire program. (Lewis)

RECORDER, WIRE A device for recording sound on a steel wire by placing magnetic fields on the wire. Tape recorders have supplanted wire recorders for most uses. (Brown)

RECORDING HEAD See HEAD, RECORDING

REDUNDANCY or T FUNCTION (Information Theory) That property of a message which reduces the error of prediction for a given event to less than chance by virtue of the fact that the message contains information about what will come next. (English)

REDUNDANCY (of a SOURCE) (Information Theory) Broadly, a property given to a source by virtue of an excess of rules (syntax) whereby it becomes increasingly likely that mistakes in reception will be avoided. (Cherry)

REEL (MOTION PICTURE) The standard unit of film length when referring to a completed production. It is a one-reel or two-reel film. A reel consists of 360 feet of 16mm film or 900 feet of 35mm film, requiring ten minutes of screen time. . . . Release prints are always maintained on reels, whereas stock footage (original and print) is maintained on cores. (Gordon)

REEL, SUPPLY Reel which supplies film or tape as it is being recorded or played back. Also called "feed reel." (D & T Comm)

REEL, TAKE-UP Reel which receives film or tape as it is being recorded or played back. (D & T Comm)

REFERENT That which a sign "refers to," or "stands for," or denotes, more especially when this is a physical or imagined thing, event, quality, etc. (Cherry)

REFLEX CAMERA A single or double lens camera in which the object to be photographed is seen in focus on a ground glass or viewing lens. In single lens style, the same lens is used for viewing and taking; in double lens style, a view and focus lens is coupled with a taking lens. (Kinder)

REGENERATE To read information out of a storage unit, and then after amplification, read it back into the same storage location. (IBM)

REINFORCEMENT A technical psychological term. It denotes a process in which some stimulus, presented immediately following a response, increases the rate at which the response is emitted in a standard situation or increases the probability that the response will recur when the situation recurs. A stimulus having such an effect is reinforcing or is a reinforcer. *Knowledge of results* (*feedback* or confirmation) has been shown to reinforce correct responses of students in many learning tasks. When the student's correct response is followed by presentation of the correct answer, the probability of the correct response recurring is increased. When correct responses are not followed by knowledge of results, and when the student has no way of determining what is correct, learning does not occur. In these situations, the correct answer is a reinforcer. Considerable confusion has arisen because stimuli such as food, praise, or money are sometimes called reinforcers even in situations where they are not effective, i.e., no learning occurs when they are present or the same learning occurs even when they are not present. Experimental findings suggest that presentation of the correct answer may not be operating as a reinforcer in programed instruction. Learning has been shown to occur without confirmation of correct responses. T-65
The extent to which the correct answer may truly be called a reinforcer remains to be demonstrated. NOTE: Educators should be aware that the psychological use of the term "reinforcement" does not parallel their own use of it. The two definitions are quite distinct. In both cases, a response is strengthened, but the procedures differ. In educational parlance, repetition or rehearsal is the procedure denoted by "reinforcement." (Markle)

RELEASE PRINT A composite print, including both picture and sound (unless it is a silent film), available for exhibition on standard projection equipment. (Gordon)

REMOTE CONTROL Mechanical and/or electrical installation which make possible the control, operation, and adjustment of such devices as projectors, cameras, tape recorders, electronic learning labs, audio and video systems in adjacent or remote areas by means of special switches and electrical relays. (D & T Comm)

RE-RECORDING See DUBBING

RESOLUTION Ability of a television system to distinguish and reproduce fine detail in the subject picked up by the camera. (Lewis)

RESPONSE A technical psychological term used by programers to designate a wide variety of behavior. It may involve the production of anything from a single phoneme or letter, word or phrase, to the solution of a problem requiring an hour or more. It may involve selection among alternatives (multiple-choice) in which case the term "response" often includes the non-verbal manipulation of buttons, keys, etc. (Markle)

RESPONSE, CONSTRUCTED A response produced by a student to complete a sentence, solve a problem, or answer a question. A model of the response may be provided for the student to copy, but as long as he writes, says, or thinks it rather than selecting it from a set of alternatives, the response is constructed. (Markle)

RESPONSE, COVERT An internalized response which the student presumably makes but which is neither recorded nor otherwise available to an observer. A student who is producing T-66 an oral or written response must think of the response (i.e., respond covertly) before producing it. Experimentation is underway to determine the relative contributions of the covert and the overt components of responding in programs of various sorts and with students of various ability levels, etc. (Markle)

RESPONSE DEVICE See TEACHING MACHINE

RESPONSE, MULTIPLE-CHOICE The selection of one out of two or more alternatives provided by the programer for the student. The provision of the correct answer among the alternatives prevents the student from responding "in his own words" but does not necessarily produce a smaller step nor an easier item than some constructed-response items. The provision of incorrect alternatives, Skinner argues, may "strengthen unwanted forms of behavior," i.e., the student may retain the erroneous information despite the provision of knowledge of results. Where the desired behavior is a selection of or a discrimination between alternatives, the multiple-choice item seems the more efficient training and testing technique. (Markle)

RESPONSE, OVERT An oral, written, or manipulative act on the student's part which is, or can be, recorded by an observer. Whether such a response contributes significantly to learning or not, overt responses provide the data on the basis of which programs are revised. (Markle)

RESPONSE, PASSIVE Synonymous with RESPONSE, COVERT

RESPONSE PROMPTING See PROMPT

RETRIEVE (RETRIEVAL) When a message is stored it is obvious that certain operations must be carried out to ready it for being displayed. These operations constitute the act of retrieval. This act includes such operations as initiating the retrieval operation and transportation from the point of storage to the point of display. (TerLouw)

REVERSAL FILM See FILM, REVERSAL

REWARD A satisfaction-yielding stimulus or stimulus object that is obtained upon the successful performance of a task (which may be self- or other-imposed). (English)

REWIND (1) (Verb) Act of returning recording tape or projection film from take-up reel to supply reel after playback or projection; (2) (Noun) Unit, often built into recording or projection equipment, which when threaded and electronically (or manually) activated, returns material to the supply reel. (D & T Comm)

RF See RADIO FREQUENCY

ROOM DARKENING See LIGHT CONTROL

ROUGH CUT The assembled work print of a motion picture in its first assembly stage. A preparatory step before beginning the "smooth cut." (Gordon)

R.P.M. "Revolutions per minute"; most commonly used in reference to phonograph turntable speeds when transporting disc recordings at speeds of $16\frac{2}{3}$, $33\frac{1}{3}$, 45, or 78 r.p.m. (D & T Comm)

RULEG A systematic technique for constructing programed sequences, developed by Evans, Glaser, and Homme. All verbal subject matter is classified into (1) RU's: A class including definitions, formulae, laws, etc., and (a) EG's: A class including descriptions of physical events, theorems, statements of relationships between specific objects, etc. The latter provide examples (EG's) of the former class of statements. With this classification scheme, the authors recommend that programers introduce new information according to the formula "RU, EG, incomplete EG," the student's response being the completion of the incomplete example. For instance, the student could be given a spelling rule and a correctly spelled example of it and be required to spell a second such word. The advice has caused controversy. Some programers prefer an inductive approach, leading the student through a series of examples (EG's) before having him formulate the RU himself. This approach has been tagged "EGRUL." (Markle)

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SATELLITE COMMUNICATION The use of one or a series of orbiting man-made satellites which are equipped to receive, amplify, and re-transmit (or merely reflect from its surface) microwave signals from and to specially-adapted transmitters and receivers several hundred or thousand miles apart; first experimental application for transmission of radio, television, and telephone signals between Europe and the United States made by Telstar satellite in July, 1962. (D & T Comm) T-68

SCANNING Systematic impingement on all parts of an area by a narrow beam of light, or other electromagnetic radiation, which is either initially modulated (optical sound recording) or which becomes modulated in the scanning process (television, optical sound pickup). (UFPA)

SCHEMATIC DIAGRAM Diagram that indicates by symbolic representation the connections and functional components of an electrical device. (USOE)

SCOOP A floodlight employed to illuminate large areas at close range. (Lewis)

SCRAMBLED BOOK A book which presents an intrinsic program. The pages are not read consecutively. Following the information presentation, a multiple-choice question is given. The answer the student selects refers him to a particular page for confirmation or correction. He may be sent either forward or backward in the text, the number of pages in either direction being randomized. Thus, no clue to which alternative is correct can be found in the page reference accompanying each alternative. (Markle)

SCRIPT A set of written specifications for the production of a motion picture, television program, or other rendition of a presentation; includes narration and presentation layout. (D & T Comm)

SEARCH The operation of determining whether certain information is in storage, the manner in which it is organized and where it is located. As information is stored in a wider diversity of forms, the problem of search becomes increasingly complex. Another complicating factor is the need to include in the search procedure such considerations as the character of the audience for which the message is designed and the task it proposes to do. (TerLouw)

SELF-MONITORING SYSTEM In a language lab, equipment which permits the student to hear his own voice performance wither simultaneously through "activated" headphones or delayed, by means of playing back his recording. (USOE)

SELF-PACING See PACING

SEMANTICS (1) The science of meanings of words or other signs; the rules that describe the way signs relate to objects; (2) General semantics: the study of human responses to signs and symbols. (English)

SEMIOTIC The science of signs. Its main subdivisionsare semantics, syntactics, and pragmatics. Each of these, and so semiotic as a whole, can be pure, descriptive, or applied. Pure semiotic elaborates a language to talk about signs, descriptive semiotic studies, actual signs, and applied semiotic utilizes knowledge about signs for the accomplishment of various purposes. (Morris)

SEQUENCE A series of scenes, items, or experiences directly related by subject or by underlying thought. (D & T Comm)

SHADOW AREA Due to TV transmission characteristics, particularly on UHF channels, some communities do not receive satisfactory signals from television stations because of natural barriers, such as mountains and terrain variation. The areas where the signals cannot get through are known as "shadow areas." (Lewis)

SHAPING A training procedure in the psychological laboratory. A complex performance is shaped by beginning with some response the animal is likely to make that is somewhat similar to or a small component of the desired terminal performance. The criteria for reinforcement are gradually shifted toward the complex behavior. For example, with turning a full circle as the terminal behavior, the trainer might reinforce a head motion as a first approximation, then wait until a step accompanies the head motion before delivering another reinforcement, then two steps, until the animal is turning a full circle. Parallels are drawn between this training procedure and programed sequences which begin with copying behavior and move through highly prompted items T-70
through fading to the final criterion performance. (Markle)

SHIELDING Enclosing wires or magnetic heads with metal to prevent stray currents from reaching them and causing hum. Most shields are "grounded." (USOE)

SHOT (1) A single run of the camera; (2) The piece of film resulting from such a run. Systematically joined together in the process of editing, shots are synthesized first into scenes; the scenes are joined to form sequences, and the sequences in turn are joined to form the film as a whole. The specific meaning of designations for shots varies with the application, but, in general, a "close-up" suggests that the frame area is well filled by the image of the subject, whether the subject is a mountain or a mole hill. In a similar way, a "long-shot" suggests that the image of the subject occupies a relatively small portion of the frame area, and that the central subject is in this way visually related to its immediate environment. Thus, the camera-to-subject distance, the focal length of the lens, and the absolute size of the subject influence the arbitrary designation for a specific shot. In view of these variable factors, the exact meaning of the following shot designations should be interpreted in relation to specific applications.

Close-up: Image of subject fills greater part of frame area.

Cut-away: Action going on at the same time as, but not part of, the main action.

Cut-in: Usually an extreme close-up of part of the main action.

Dolly: Camera moves translationally in space as shot proceeds.

Establishing: Any shot used to orient the audience in regard to location, time, or circumstances of action.

High-Angle: Subject or center of interest lies below camera level.

Insert: Usually a close-up, showing detail necessary for proper understanding of the over-all action of a sequence.

Long: Image of subject relatively small in frame, shows relationship of subject and setting.

Low-Angle: Subject or center of interest lies above camera level.

Medium: About halfway between a long shot and a close-up to simulate normal viewing distance.

Medium Close: About halfway between a close-up shot and a medium shot.

Medium Long: About halfway between a long shot and a medium shot.

Over-the-Shoulder: Of one person from behind or near the shoulder of another person.

Pan: Camera moves in azimuth as shot proceeds.

Re-establishing: Usually a long shot, from a new angle, in the middle or at the end of a sequence.

Reverse Angle: Angle changes nearly 180 degrees.

Running: Camera moves to pace movement of subject as shot proceeds.

Wild: Any shot made without matching synchronous recording.

Zoom: Apparent motion of camera toward subject as shot progresses. Achieved either through rapid motion of camera, or with zoom lens. (See also ANGLE SHOT, TRUCKING.) (UFPA)

SHUTTER In a motion picture camera, the mechanical device which shields the film from light at the aperture during the film movement portion of the intermittent cycle. Also, a similar device in projectors for cutting the projection light during the time the film is moving at the aperture. (UFPA)

SIGN (Noun) (1) In general, an indicator (see SIGNAL, SYMBOL); (2) Any object or event--especially in action, or the direct result of an action--perceived as having a significance beyond itself; e.g., the blush of embarrassment, the slouched posture of fatigue or boredom; (3) A stimulus that substitutes for another in evoking a response--e.g., conventional gesture standing for a word or words, or for an idea; e.g., nodding for "yes," the sign language of the deaf. (English)

SIGNAL A SIGN communicated by one person to another in order to indicate that the time and place for a certain action are at hand. (English)

SIGNAL (BROADCAST) The waves, impulses, sounds, pictures, etc., transmitted or received; the wave which modulates the carrier wave. (D & T Comm)

SIGNAL MULTIPLEXING A device for the mixing of several signals for transmission over a single system. Microwave relays are often multiplexed to carry video and audio signals simultaneously. (Lewis)

SIGNIFY To signify is to act as a sign in a process of semiosis. "To have signification" and "to have a significatum" are synonymous with "to signify." A sign is said to signify (but not denote) its significatum, that is, the conditions under which it denotes. All signs signify; not all signs denote. (Morris)

SIMULCAST The simultaneous transmission of the same program over two different stations. In some instances, this is done with a pair of AM and FM stations, or the audio portion is broadcast over a radio station while the complete program is sent out over a television station. (Lewis)

SINGLE FRAME Term applied to a 35mm filmstrip on which the pictures are photographed so that the width of the picture is crosswise on the film. Single frame pictures are ¾" × 1" and the film is inserted in the projector vertically. (Kinder)

SKINNER DEVICE A class of devices providing a small space for information presentation, a small space for the student to write his response, and a mechanism for revealing the correct answer for comparison after the student has responded. The original model presented material printed on a disk (hence "disk" became synonymous with "lesson"), one segment or frame of which was visible at the time. When the student exposed the correct answer, his response was simultaneously shielded under a transparent mask, preventing erasure. If the student scored his response as incorrect, the machine returned the item for a second try at a later time. Items scored as correct dropped out. Present versions of Skinner-type machines lack this "recycling" feature. (Markle)

SKINNER-STYLE PROGRAM See PROGRAMING, LINEAR

SLAVE UNIT Tape drive on which blank tapes are run for the purpose of simultaneously duplicating several copies of a master tape. (USOE)

SLIDE Term most frequently used for 2" × 2" and 2¼" × 2¼" mounted transparencies. The 3¼" × 4" size is termed LANTERN SLIDE; larger 7" × 7" and 10" × 10" sizes are usually termed TRANSPARENCY, and are designed for OVERHEAD PROJECTOR use. (D & T Comm)

SLIDE PROJECTOR Projection instrument designed to accept 2" × 2", 2¼" × 2¼", and 3¼" × 4" mounted transparencies; slides may be advanced individually or on a slide cartridge through manual or remote controls. Projectors which accept the 3¼" × 4" slides exclusively are usually referred to as LANTERN SLIDE PROJECTORS. (D & T Comm)

SOLENOID Electromagnet which forces a piston to move by magnetic action when a current is introduced in order to activate a mechanical operation in a piece of electronic equipment. (D & T Comm)

SOLID-STATE ELECTRONICS Term used to describe a special type of small electronic component, such as transistors, which have no lighted or heated filament and which can be used instead of vacuum tubes in most electronic circuits. (USOE)

SOLID STATE LOGIC Utilization of solid state devices to perform logical functions as opposed to vacuum tube devices. (IBM)

SORTER-COLLATOR In data processing, a special machine, built to handle specific jobs of sorting and collating as determined by a code. (D & T Comm)

SOUND A train of compressional waves transversing air (or other gaseous, liquid, or solid media) at some frequency or combination of frequencies within the audible range (approximately 12,000 to 18,000 cycles per second). (UFPA)

SOUND DRUM The portion of the mechanism of a sound motion picture projector around which the film passes at the point where the sound is picked up. The sound drum is usually attached to a flywheel to stabilize the movement of the film through the projector at this point. (Brown)

SOUND EFFECTS Any sound from any source other than the dialogue, narration, or music in an audio presentation which enhance the illusion of reality. (D & T Comm)

SOUND-ON-SOUND Adding a new signal to a prerecorded signal as it is being played. Both signals are mixed and recorded together on a single track of another recorder. (USOE)

SOUND TRACK The portion of the motion picture film on which the sound is recorded, normally one band in 16mm along the edge opposite the sprocket holes. It may be optical or magnetic, or both, and with stereo sound may have two or more tracks. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Gordon)

SOURCE (of MESSAGE-SIGNALS) That part of a communication channel where MESSAGES are assumed to originate (where selective action is exerted upon an ensemble of SIGNS). (Cherry)

SPEED, SILENT See FILM, SILENT

SPEED, SOUND See FILM, SOUND

SPLICE Joining two pieces of motion picture film or recording tape. Film splicing is accomplished by welding the film ends together in a special machine, and with special cement, to ensure accurate joining. A special splicing tape is used to join pieces of recording tape. (Brown)

SPONSORED FILM Any film whose production costs have been borne by someone or a company for the purpose of exhibiting the film free of admission charges (or rental costs); it is intended to accrue credit or prestige to the sponsor. On occasion, sponsored film are shown in locations where an admission fee is charged. (Gordon)

SPOTLIGHT Lighting fixture offering a concentrated beam of illumination. Models vary from small low-wattage units to large 5,000 watt arrangements. (See also LIGHTING.) (Lewis)

SPROCKET HOLES Holes along the edge of film that engage teeth in sprocket wheels. Sprocket wheels turn to advance film through the projector (or camera). (Brown)

SQUEAL Noise caused by worn or dirty pressure pads or by tape which lacks special lubrication treatment. (USOE)

STACKER The output receptical for cards on a card feed. (IBM)

STANDARD SPEED A confusing term applied to phonograph records made prior to the advent of long-playing records; meant to describe the 78 r.p.m. speed. (Brown)

STEP An indefinite intuitive concept basic to programing. A subject to be programed is broken down into "steps." It is assumed that students cannot take later steps in a given sequence before taking the early steps. It is also assumed that each step represents a step forward. If students cannot respond correctly to an item, the item is "too large a step." The emphasis in linear programing is on "small steps" with a resulting low frequency of error. A step represents a combination of (1) A subjective judgment that an item represents progress in the student's mastery, and (2) An objective measure of the student's ability to respond correctly to the item. The size of the step is not necessarily related to the size of the response--a lengthy response may represent only a small step forward--nor is it necessarily related to the amount of material contained in an item. A programer generally increases the number of items in order to reduce the "size of the steps." (Markle)

STEREO-CAMERA A camera with two lenses which takes two pictures simultaneously. When the finished pictures are properly mounted, the viewer gets a three-dimensional image. (Kinder)

STEREO TAPE (FOUR-TRACK) See TAPE, STEREO (FOUR-TRACK)

STEREO TAPE (TWO-TRACK) See TAPE, STEREO (TWO-TRACK)

STEREOGRAPH Picture prepared for use in a stereoscope. (Kinder)

STEREOPHONIC Term denoting an audio technique or presentation in which two microphones are placed some distance apart and signals are fed simultaneously into two separate channels. Playback by broadcast, disc, or tape provides a dimensional effect when sent through two separate amplifiers and loudspeakers which are placed some distance apart for reproducing the two signals. (D & T Comm)

STEREOSCOPE A device designed to give the illusion of seeing pictures in three dimensions. Very popular in past generations. Currently, three-dimensional viewers are available for color film in devices produced under brand names such as Viewmaster or Tru-Vue. (Brown)

STEREOSCOPIC FILM Film exposed in matching pairs of frames, with one frame of each pair representing the right-eye view of the scene, and the other frame representing the left-eye view of the scene. A slight but definite difference in angle of view, or parallax between right and left eye versions of the scene provides a realistic depth perception cue when the right-eye positive picture is presented exclusively to the viewer's right eye, and the left-eye positive is presented exclusively to the viewer's left eye. (UFPA)

STILL-MOTION SLIDES Through the use of polarized overlays on slides and overhead transparencies and a revolving disk at the projection lens of the projector, various forms of movement can be simulated in a stationary slide. Linear motion, turbulence, radiation, blinking and rotary motion are some of the movements that can be simulated. This technique lends itself to display box animations, flow charts of process, as well as slide and overhead projector presentations. (ANA)

STIMULUS A technical term in psychology designating a class of events which impinge on an organism's sensory equipment and which experimenters can manipulate, describe, or hypothesize to exist. Stimuli are linked as observable (or hypothesized) antecedents to specific responses. In S-R (stimulus-reponse) psychology, the stimulus is a necessary antecedent to a response. Skinner's position places more emphasis on the consequent (reinforcing) stimuli than on the antecedents. In a program, the content of the item is the stimulus. This includes the terminal stimulus (the bare bones of the question or statement), any additional stimuli operating as prompts or models, and any external material such as panels. (Markle)

STIMULUS DEVICE See TEACHING MACHINE

STIMULUS-RESPONSE DEVICE See TEACHING MACHINE

STIMULUS, TERMINAL The unprompted question, incomplete statement, or problem to which the student is taught to respond. This stimulus may occur as part of a prompted item which is not, therefore, a terminal item. (Markle)

STOP The relationship between the focal length of a lens and the effective diameter of its aperture. An adjustable iris diaphragm permits any ordinary photographic lens to be used at any stop within its range. The numerical series 1.0, 1.4, 2.0, 2.8, 4.0, 5.6, 8, 11, 16, 32, 45, 64 constitutes a range of "full stops" in that closing the diaphragm from any one of these f-numbers reduces exposure by one-half; or, opening the diaphragm from any number doubles the exposure. (See also f-VALUE and T-STOP.) (UFPA)

STOP-MOTION PROJECTOR A projector designed with speed controls and a stop-start mechanism so that images can be projected at variable speeds or held immobile. (Kinder)

STORAGE Implies some method of keeping data for future reference. For example, in computer processing--permanent storage on tapes, intermediate storage on drums and rapid access storage on magnetic cores. (D & T Comm)

STORE (STORAGE) The interval between the creation of the message as a unit or organized data or information and its presentation to the senses of the individual. In direct speech or a live demonstration the delay is zero. However, both events can be stored for delayed read-out by appropriate methods. The information loss characteristic of the storage system is a factor to be considered. Space occupied by the stored information is another significant factor. (TerLouw)

STORYBOARD A detailed outline or shooting script used in the production of a sequential visual presentation. (D & T Comm)

STRATOVISION The use of high-flying aircraft to retransmit television programs originating from ground base stations or to transmit directly from video tape systems. (Latter is employed by the Midwest Program on Airborne Television Instruction.) (D & T Comm)

STRIP FILM See FILMSTRIP

STROBOSCOPE A series of dots or parallel lines which appear to stand still when a turntable is rotating at the corresponding speed. (D & T Comm)

STUDENT POSITION OR STATION Desk, table, or booth where student equipment is located for receiving a program and reacting to it. (D & T Comm)

STYLUS A phonograph needle; also a needle for cutting recording disks. (Brown)

SUBLIMINAL (1) Below the threshold; of stimuli that cannot be discriminated under the conditions of the experiment; (2) Of stimuli that are too weak to be specifically apprehended and reported but not too weak to be influential on conscious processes or behavior; or of the effects of such stimuli. (English)

SUPPLY REEL See REEL, SUPPLY

SUSTAINING PROGRAMS Programs which are not paid for by a sponsor, but are put on the air as a service by the broadcasting station (e.g., early morning instructional broadcasts on television). (Kinder)

SYMBOL A symbol is a substitute for a sign with which it is synonymous. Symbols are producible by the person using them with the intent of modifying the behavior of other persons in a specific direction. For effective communication the symbol must have the same meaning for the user as for the interpreter, that is, the user of the symbol implicitly or explicitly reacts to it in the same manner as its interpreter. In this connection, the communicator's intent, which is a private affair, is effected only when there exists this commonality of meaning. Whether or not symbols have the same meaning for communicator and interpreter is a major area of communication study and must never be taken for granted. (Fearing)

SYMBOLIC LOGIC The process of describing logic in terms of standard symbols so as to facilitate the reasoning process used in obtaining a result. (See LOGIC.) (IBM)

SYMBOLISM Representation of things, ideas, or meanings by signs, labels, conventions, or words. Usually used to express abstract ideas. (Kinder)

SYNCHRONIZED In motion picture projection, refers to the proper relationship between the sound and the picture on the screen. If lip movement and speech do not occur in proper relationship, the picture and sound are "out of synch." (Brown)

SYNCHRONIZED MOTION PICTURE PROJECTOR A motion picture projector that is specially equipped with a speed and shutter mechanism that is compatible with the television frame and scanning system. The use of nonsynchronous projectors ordinarily results in interference patterns on the reproduced images. (Lewis)

SYNCHRONIZING GENERATOR An electronic generator that supplies pulse patterns for the control of television circuits. EIA (RETMA) pulses are required for on-the-air broadcast; random or non-EIA pulses may be employed for local systems of a closed-circuit nature. (Lewis)

SYNTACTICS That branch of semiotic that studies the way in which signs of various classes are combined to form compound signs. It abstracts from the signification of the signs it studies and from their uses and effects; hence, it is distinguished from semantics and pragmatics. (Morris)

SYSTEMS APPROACH An integrated, programed complex of instructional media, machinery and personnel whose components are structured as a single unit with a schedule of time and sequential phasing. (Its purpose is to insure that the components of the organic whole will be available with the proper characteristics and at the proper time, to contribute to the total system, and in so doing to fulfill the goals which have been established.) (D & T Comm)

SYSTEMS DESIGN (IN EDUCATION) Provides a conceptual framework for planning, orderly consideration of functions and resources, including personnel and technical facilities such as television, the kinds and amount of resources needed, and a phased and ordered sequence of events leading to the accomplishment of specified and operationally defined achievements. A systems approach should provide a way of checking on the relation of performances of all components to factors of economy and should reveal any inadequacies of the several components, including the faults of timing and consequently of the entire system. (Carpenter)

SYSTEMS ENGINEER Studies problems in industry, science, business, and government, and then organizes electronic data processing techniques and machine systems to solve them. He works at the source and with management in the organization concerned. (IBM)

SWITCHER, CAMERA A set of push buttons mounted on a box or panel that allows selection of the television image from any of several cameras. The image can then be fed into a closed-circuit distribution system or to a broadcast transmitter. (Lewis)

SWITCHING CIRCUITS A circuit which causes a start-and-stop action, or a switching action, by electronic means. In computers, this is performed automatically by the presence of a certain signal, usually a pulse signal; when combined, they can perform a logical operation. (IBM)

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T-STOP A system of calibration for rating the speed of lenses. This direct system is based on actual light transmission and is beginning to be recognized as more realistic than the older f/stop system. (See also f-VALUE and STOP.) (Lewis)

TABULATE (PRINTER) The printing of group totals with a coded or alphabetical description. This differs from listing in that the individual cards are not shown but are rather hidden in the total. (IBM)

TACHISTOSCOPE A flash meter; a device similar to a shutter of a camera, used to permit momentary exposure of slides or portions of slides for instruction. (Lewis)

TAKE-UP REEL See REEL, TAKE-UP

TALK-BACK Use of an intercommunication system to provide voice contact between the television director and the crew or, in some closed-circuit applications, to permit students in remote classrooms to ask questions of the television instructor. (Lewis)

TALKING BOOK A microgroove disc prepared to play at a speed of $16\frac{2}{3}$ r.p.m. (Kinder)

TAPE CARTRIDGE Magazine or hard plastic case containing a reel (or two) of tape which is placed on a recorder without threading. Reel-to-reel cartridges allow the tape movement to be controlled in either direction. Endless-loop or continuous-loop cartridges can continue playing indefinitely but do not permit rewinding at will. (USOE)

TAPE DECK See TAPE TRANSPORT

TAPE, DUAL-TRACK or TWO-TRACK or HALF-TRACK MONAURAL Two full-length recordings--one on each half of the tape. In order to play the second track of a dual-track recording, it is not necessary to rewind the tape; merely switch the position of the feed reel and the take-up reel and rethread the machine. (ColoU)

TAPE, FULL-TRACK or SINGLE-TRACK A monaural recording which covers the full width of a recording tape. (ColoU)

TAPE, LEADER Special nonmagnetic tape attached to ends of the tape for identification and protection of the tape ends. (USOE)

TAPE, MAGNETIC See MAGNETIC TAPE

TAPE PLAYBACK Tape reproducer unit for playback only of prerecorded tapes. It is not equipped to record. (USOE)

TAPE, PRERECORDED Tape which has a program already recorded on it or duplicated before use. (USOE)

TAPE RECORDER See RECORDER, TAPE

TAPE SPEED Tape moves past the recording head at a predetermined speed measured in inches per second (ips). The faster the speed, the better the audio quality or frequency response. Standard speeds are $1\frac{7}{8}$ ips, $3\frac{3}{4}$ ips, $7\frac{1}{2}$ ips, 15 ips, and 30 ips. Most standard recorders use $7\frac{1}{2}$ ips and $3\frac{3}{4}$ ips. (USOE)

(Note: Corresponding standard speeds in centimeters per second are 4.75, 9.5, 19, 38, and 76.)

TAPE SPILLAGE Improper threading or poor adjustment of braking action or tension may result in spillage of tape. (USOE)

TAPE, STEREO (FOUR-TRACK) Also known as "quarter-track" or four separate monaural tracks; produced by recording four separate tracks on one tape. For stereo these tracks can be recorded in pairs running on each of two directions. In producing a stereo tape the first and third tracks are recorded in opposite direction. Monaural four-track recordings are made only one track at a time. (ColoU)

TAPE, STEREO (TWO-TRACK) Also referred to as "half-track stereo"; requires two, separate, parallel tracks on a single tape. This type of recording is similar to the dual-track recording except both tracks are recorded in the same direction and the tape must be rewound in order to play again. (ColoU)

TAPE TRANSPORT Also called a "tape deck" or "tape drive." Mechanism which moves the tape past the heads. It includes head assembly, motor, and controls for tape movement. It does not normally refer to the electronic components which together with the transport mechanism constitute a tape recorder. (USOE)

TAPE, VIDEO A tape used in the process of recording picture and sound from television programs by a magnetic process similar to sound recording on tape. (Brown)

TEACHING MACHINE A device for presenting a program. Most machines control the material to which the student has access at any moment, preventing him from looking ahead or reviewing old items. Many machines contain a response mechanism; a tape on which the student writes, a keyboard, or selection buttons. Some provision is made for knowledge of results, either by revealing the correct answer after the student responds or by advancing to the next item, thereby signaling correct completion of the previous item. A few machines score the student's response and tabulate errors. Machines are being developed which will select the next step on the basis of the student's response. This type of machine, in combination with a branched program, comprises what Stolurow calls an ADAPTIVE TEACHING MACHINE.

In Porter's terminology, a teaching machine is a STIMULUS-RESPONSE DEVICE providing immediate reinforcement. Such machines are distinguished from (1) STIMULUS DEVICES, such as films, phonographs, etc., which present information but make no provision for responses from the student, and likewise from (2) RESPONSE DEVICES such as typewriters which provide for practice but not for controlled input of information. A teacher may provide the missing half of either a stimulus device or a response device. (See PRESSEY DEVICE and SKINNER DEVICE.) (Markle)

TEAM TEACHING Restructured system of education, especially in elementary schools, where a team of teachers supervised by a team leader work with large groups of students, and smaller combinations for more specialized teacher-student interchange. Provides for fuller utilization of teachers talented in specific subject areas, freer exchange of ideas and evaluation, and often with the assistance of an aide, more thorough class preparation and application of audio-visual communication media and techniques. (D & T Comm)

TECHNOLOGY (1) A systematic body of facts and principles related to a comprehensive, practical and useful end. The term is not limited to industry or engineering. The principles of effective teaching (pedagogy), for example, comprise a technology. (2) The actual processes of manufacture in a given industry or plant. (English)

TELECOMMUNICATION Any transmission, emission or reception of signs, signals, writing, images and sounds of intelligence of any nature by wire, radio, visual or other electromagnetic systems. (D & T Comm)

TELECOURSE A full sequence of lessons offered over closed-circuit or broadcast television for credit or for auditing purposes. Depending upon the individual institution sponsoring the activity, written requirements, reading assignments, and examinations are included. (Lewis)

TELEGUIDE A study guide for a forthcoming telecast. (Kinder)

TELEMATION A complex of existing devices combined into one rather intricate instrument which includes a wall-sized panel of three (or more) translucent screens; a tape recorder, movie projector, three transparency projectors and one opaque projector--all situated behind the screens; an instructor's lectern; and pushbutton control panel for operating the equipment. Can be programed on a punched tape for automatic presentation. (See also TELEPROMPTER.) (D & T Comm)

TELEPROMPTER A mechanical "cue" feeder to television actors (or teachers) has been broadened and developed into one of the effective mechanical aids available to speakers (or lecturers).

Large typed words, eight times the size of regular typewriter type, unroll through a compact unit in front of the speaker. The typed words, on a long roll of paper, enter the speaker's field of vision at a rate of speed controlled by either the speaker or an assistant.

It is possible to go back in the speech or go forward at an accelerated rate if the occasion demands.

Using more than one unit in synchronization, the speaker can apparently look the audience in the eye as his eyes travel back and forth from the multiple teleprompters placed to the left and right of the lectern.

By incorporating a set of solenoid switches in one of the teleprompters and placing thin strips of adhesive-backed aluminum foil on the foll of teleprompter paper at the cue words, to activate the switches, recorders, projectors, and room lights can be turned off and on in synchronization with the speaker's delivery. (See also TELEMATION.) (ANA)

TELESCOPIC PHOTOGRAPHY A photographic technique of taking pictures of objects too distant for the ordinary camera lenses; hence, the use of a telephoto lens. (Kinder)

TELOP An opaque projector arranged to project images picked up by reflecting light from the surface of opague graphics, such as pictures, drawings, typed material. It is not necessary to employ slides or other transparencies with unit. A part of a multiplexer arrangement, the "Telop" feeds projected images to the television camera. (Lewis)

TERMINAL BEHAVIOR The behavior the student is expected to have acquired at the end of a program or programed sequence. Evidence that such behavior has indeed been acquired is provided by successful responses to TERMINAL ITEMS and/or by performance on a CRITERION TEST. The terminal items contain no prompts and are placed far enough from the training sequences to measure more than immediate memory. Criteria vary in testing of programs as they do in any other learning situation. Criterion tests may involve multiple-choice items, fill-in items, essays, or performance of some task. They may be given immediately after (ACQUISITION) or considerably later than the learning sequence (RETENTION). They may involve only the actual material explicitly covered in the learning sequence or they may involve extension, generalization, or application of the learned material, generally called TRANSFER. (Markle)

TERMINOLOGY The system of terms, especially of technical terms, used in a given learned discipline, art, craft, or technology; or the study of the effectiveness of such a system. (English)

THEMATIC PROMPT See PROMPT

THERMOPLASTIC RECORDING A process which combines the processing speed and versatility of magnetic recording and the storage capacity of photography; it can concentrate 100 times as much information in a given space as can magnetic recording. It records almost instantaneously and will produce pictures in color or black-and-white, but does not require chemical processing and can be erased and reused as desired. Presently under experimental development by General Electric. (D & T Comm)

THREAD To place film or tape correctly in the prescribed path of a projector or tape recorder. (D & T Comm)

THROW Distance from a projector to the projection screen. (D & T Comm)

THUMB MARK An identification point drawn on or marking device pasted onto the upper left- or righthand corder of slides to insure consistent, proper insertion in the projector. (D & T Comm)

TIME-LAPSE A motion picture technique used for visualizing normally invisibly slow processes. In the original photography a greater than normal time interval elapses between exposures of successive frames. Projection at normal projection speed results in an apparent speed-up of the action. The degree of the speed-up effect achieved depends on the time interval between successive exposures when the original is made. (UFPA)

TONE ARM The movable arm on a phonograph which holds the needle that is used to pick up vibrations from the record grooves. (Kinder)

TRANSCRIPTION A term applied specifically to phonograph recordings originally designed for broadcast use. The disks, approximately 16 inches in diameter, are played at a speed of 33⅓ r.p.m., using a 3-mil stylus. Transcriptions were originally designed to provide approximately 15 minutes of time per side as a convenience for radio-station scheduling. For school use, transcriptions are quickly being replaced by long-playing records. (Brown)

TRANSFER See TERMINAL BEHAVIOR

TRANSISTOR A small piece of germanium metal with unusual electronic properties which may eventually replace vacuum tubes in audiovisual equipment. One of the chief advantages lies in the fact that a small slug of this metal the size of a pencil eraser can do the work of the ordinary vacuum tube. (Kinder)

TRANSLATOR An electronic device capable of receiving a television transmission from a VHF station and converting it for retransmission on a UHF channel. A translator can also be used to pick up a program from a UHF channel and retransmit it on a different UHF channel. (Lewis)

TRANSLUCENT Semi-transparent, not clear, but capable of transmitting diffused light. (NABDC)

TRANSMISSION (COMMUNICATIONS THEORY) The processes by which a message passes from the input to the output; or the average amount of information coming from the input which reaches the output. (English)

TRANSMISSION LINE A conductor system designed to transmit electrical impulses from one location to another. This may be the line connecting the transmitter to the antenna or the coaxial cable linking separated locations. (Lewis)

TRANSMITTER (BROADCAST) A general term applying to the equipment necessary to radiate radio or television signals into space for reception at locations within the service area. (Lewis)

TRANSMITTER (COMMUNICATIONS THEORY) Any means by which a message is encoded and started on its way through a channel. (English)

TRANSPARENCY Transparent materials designed for projection in order to facilitate enlargement of the image; originally associated with 2" × 2" and 3¼" × 4" slides, the term is now more popularly associated with 7" × 7" and 10" × 10" slides used with overhead projectors. (See also OVERHEAD PROJECTOR AND OVERLAY.) (D & T Comm)

TRANSPARENT Capable of transmitting rays of light through its substance. (D & T Comm)

TREATMENT A brief written outline of a proposed cinematic (or other) rendition of a story. (UFPA)

TRIPOD A three-legged supporting stand. When used to support a camera, the legs are usually adjustable for height, and some means of fastening the camera to the top of the stand is provided. They range from very simple to very complex, depending on the elaborations incorporated in the specific model. (UFPA)

TRUCKING To move a camera translationally in space as a shot proceeds, usually by means of a dolly or other vehicular camera support. The purpose is to pace, and maintain image size of, moving actors or objects. (See also SHOTS.) (UFPA)

TRUMP PLAN A system of instruction, more particularly secondary education, or curricular organization, in which the methods of teaching, student groupings, scheduling, and teacher and pupil activities adjust to the purposes and content of instruction. Three basic learning structures utilized are large-group instruction, small-group instruction, and individual instruction. (D & T Comm)

TUNER ADAPTER See CONVERTER

TURNTABLE The rotating disk of a phonograph upon which records are carried during play. (Brown)

TURRET A rotary plate mounted on the front of a camera and provided with accommodations for two or more lenses, any of which may be moved rapidly into position for appropriate motion picture or television camera shots. (D & T Comm)

U

UHF Abbreviation for ULTRA HIGH FREQUENCY

ULTRA HIGH FREQUENCY Wave lengths reserved for commercial and educational television which lie in the wave bands of 300 to 3000 megacycles. Includes channels 14-83. Less powerful than VERY HIGH FREQUENCY. (D & T Comm)

ULTRAVIOLET The section extending beyond the violet end of the visible spectrum, the rays of which exert a high degree of photochemical action. (D & T Comm)

V

VANISHING A term originally designating the removal of more and more of the components of a specific chain of responses. In an example from Skinner, a student might be asked in the first frame to fill in a few obvious letters in a poem, then more letters, then words, phrases, and whole lines. When all the components had been vanished, the student would be reciting the whole poem. The term is often used synonymous with fading, although the process of withdrawing prompts is not strictly parallel to the above process. (Markle)

VARIABLE AREA TRACK Any sound track recorded in the form of a modified photo-oscillographic trace more or less sharply divided longitudinally into two components, one essentially transparent. (UFPA)

VARIABLE DENSITY TRACK Any sound track in which a recorded sound is represented as full track width density variations extending along the length of the track. In variable density tracks the density range from a local maximal density to an adjacent minimal density is related to amplitude, while the spacing between adjacent local maximal (or minimal) densities is related to frequency. (UFPA)

VERBALISM (1) Undue reliance upon words; the assumption that relationships suggested by facile habitual associations among words prevail in reality; (2) The uncritical acceptance of definitions as if they were explanations; (3) Wordy expression lacking meaning. (English)

VERY HIGH FREQUENCY Wave lengths reserved for commercial and educational television which lie in the wave bands of 30 to 300 megacycles. Includes channels 2-13. More powerful than ULTRA HIGH FREQUENCY. (D & T Comm)

VHF Abbreviation for VERY HIGH FREQUENCY

VICARIOUS LEARNING Learning which is indirect or secondary, not firsthand. (Kinder)

VIDEO Refers to the visual components of a television system. Video frequency is the range obtained from scanning by a TV camera tube. The highest value is restricted to 4 megacycles. This does not include provision for sound or audio components. (Lewis)

VIDEO TAPE RECORDER See RECORDER, VIDEOTAPE

VIDEOGRAPH A system of quickly reproducing opaque, permanent copies of images appearing on a special television tube. (Lewis)

VIDICON A television camera tube of much smaller physical size than the image orthicon. The vidicon requires more light for comparable operation but is less expensive in cost and operation. (Lewis)

VIEW FINDER (ELECTRONIC) A small picture tube built into a television camera and connected to the pickup circuits, thus enabling the cameraman to see exactly what is being scanned by the camera. (Lewis)

VIEWFINDER (OPTICAL) A camera component arranged to indicate the boundaries of the camera's field of view. External viewfinders may be as simple as an open wire loop used with a properly spaced pupil for viewing, or it may be an elaborate optical device with provision for altering the boundaries of its field to correspond with the field of any of several camera lenses. External viewfinders, to be accurate, must be corrected for the parallax. This possible error in framing is obviated in the case of a type of integral viewfinder which can be moved into position for viewing the field through the camera lens. (See also PARALLAX and REFLEX CAMERA.) (UFPA)

VIEWER Term most frequently employed for the table-mounted or hand-held device used by one person or a group of persons to see a filmstrip, slides, overhead transparencies, or a motion picture. Useful in previewing or editing such visual material. (D & T Comm)

VISION, PERSISTENCE OF See PERSISTENCE OF VISION

VISUAL MATERIALS Those instructional materials which communicate primarily through sight. Written and printed materials as well as projected pictures, charts, maps, objects, specimen, and the like are visual materials. (Cross)

VOLT The unit of electromotive force which will cause a current of one ampere to flow through a resistance of one ohm. (D & T Comm)

VOLUME INDICATOR See LEVEL INDICATOR

VU-GRAPH See OVERHEAD PROJECTOR

VU-METER "Volume unit" meter which indicates the relative levels of the various sounds being recorded or played. (USOE)

W

WASHBACK See BRANCHING

WATT Unit of electrical power. Usually used to denote the output of speakers or the amount of current needed to operate a device. (USOE)

WET MOUNT The process of mounting a flat picture on a heavy cardboard backing with an adhesive cement such as rubber cement; the term for the finished mounted picture or illustration itself. (D & T Comm)

WIDE-ANGLE LENS Any lens of relatively short focal length. In 16mm camera work, any lens of less than 25mm focal length. (UFPA)

WORKPRINT Any picture or sound track print, usually a positive, intended for use in the editing process to establish through a series of trial cuttings the finished version of a film. The purpose is to preserve the original intact (and undamaged) until the cutting points have been established. (UFPA)

WOW A periodic disturbance in sound. Usually caused by regular variations in angular velocity of some mechanical component of the system. (UFPA)

WRITE The process of storing a number on the surface of a magnetic tape, a magnetic drum, or a cathode ray tube. (IBM)

X

XEROGRAPHY A process of duplication in which an image is printed on paper through a series of electrical charges. (D & T Comm)

Z

ZOOM LENS A variable-focal-length lens that permits the change of focal length while the picture is being photographed, thus giving the impression of moving in and out of the scene. A shot using the zoom lens in this fashion is called a "zoom shot." (See also SHOT.) (Gordon)

APPENDIX

TERMINOLOGY

CLASSIFIED BY AREAS

1. (A) AUDIOVISUAL COMMUNICATION AND LEARNING

ABSTRACT Ideas and concepts that depend upon the capacity of the mind for understanding, rather than upon the physical senses. They are often presented through symbols which have been given meaning through associations or past sensory experiences. (Brown)

AIDS, INSTRUCTIONAL: see INSTRUCTIONAL AIDS

AUDIENCE An assembly of hearers or viewers reacting, usually passively, to a speaker or performer. (Until the advent of broadcasting, a group in physical proximity was meant, and the performer was interacting with his audience.) (English)

AUDIOVISUAL COMMUNICATIONS That branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process. It undertakes: (1) The study of the unique and relative strengths and weaknesses of both pictorial and non-representational messages which may be employed in the learning process for any purpose; and (2) The structuring and systematizing of messages by men and instruments in an educational environment. (This includes the planning, production, selection, management and utilization of both components and entire instructional systems.) Its practical goal is the efficient utilization of every method and medium of communication which can contribute toward developing the full potential of the learner. Earlier definitions: (1) That field of human expression that employs visual and auditory aids to learning, including motion pictures, television, sound and silent filmstrips, slide sets, recordings, transparencies, projected opaque pictures, and a variety of graphic arts (Gordon); (2) Used to identify instruction and learning procedures which emphasize nonprinted instructional materials. A more exact definition implies any learning experience involving both sight and sound (Cross); and (3) A generic term referring to experiences, equipment, and materials used for communication in instruction. Implies techniques based upon practices utilized in education and training. (Brown)

BEHAVIOR This term is presupposed by SEMIOTIC and not defined within it. Roughly speaking, behavior consists of the sequences of responses (actions of muscles and glands) by which an organism seeks goal-objects that satisfy his needs. Behavior is therefore "purposive" and is to be distinguished from response as such and from the even wider class of reactions. Behavior is individual or social, and when social may be cooperative, competitive, or symbiotic. (Morris)

COMMUNITY RESOURCES In education, any materials, agencies, activities, or persons in a community that may be utilized by a school program to provide learning experiences. (Brown)

CONCEPT (1) Any object of awareness together with its significance or meaning; anything one can think about that can be distinguished from other "things"; (2) A general meaning, an idea, or a property that can be predicted of two or more individual items; (3) Knowledge that is not directly perceived through the senses but is the result of the manipulation of sensory impressions. (Thus one may directly perceive in Dobbin certain properties, but for a concept one must also apprehend these properties as constituting part of the general notion of "horsiness.") A concept requires both abstraction and generalization--the first to isolate the property, the second to recognize that it may be ascribed to several objects. (English)

CONCEPTUAL LEARNING A highly developed form of learning in which meanings take on generalized understandings. (Kinder)

CONCRETE Specific; based upon direct sensory experience, as opposed to abstract. (Brown)

CONE OF EXPERIENCE A graphic representation of a theory proposed by Edgar Dale in which all general categories of experience are placed at different levels upon a gradually narrowing cone--the rich, personal, sensory experiences at the base, and the highly abstract, symbolic experiences at the top. As we move upward on the cone, we travel from the most direct to the most indirect experiences--for example, from the small child's first building with blocks to $e = mc^2$, a formula in atomic energy. (D & T Comm)

CONTRIVED EXPERIENCES Learning experiences that are designed to simulate real-life situations. They often use real things, or effective substitutes for real things, to give verisimilitude to experiences. (Brown)

CROSS MEDIA APPROACH Methodology based on the principle that a variety of audiovisual media and experiences correlated with other instructional materials overlap and reinforce the value of each other. Some of the material may be used to motivate interest; others to communicate basic facts; still others, to clear up misconceptions and deepen understanding. Same as MULTI MEDIA APPROACH. (D & T Comm)

DIRECT EXPERIENCE A term generally used to explain a learning process based upon actual experience with real things in a real (true-to-life) situation. Learning to sell by working in a store is one example. (Brown)

DISPLAY (Verb) An act or process of presenting sensory data to the learner. This may be scheduled or unscheduled (bulletin board, museum, etc.). (TerLouw)

GRAPHIC COMMUNICATION The preparation, presentation and interpretation of static, two dimensional, symbolic visual material. (The word "Symbolic" is included to indicate that most graphics are representations of the original, and the presentation of the actual originals themselves.) (Langston) T-96

INSTRUCTIONAL AIDS Devices which are used simply to assist a professor in the teaching-learning process by presenting supporting or supplementary material, usually intermittently. They are not self-supporting. (See also INSTRUCTIONAL MEDIA.) (D & T Comm)

INSTRUCTIONAL MEDIA Devices which present a complete body of information, and are largely self-supporting rather than supplementary in the teaching-learning process. (See also INSTRUCTIONAL AIDS.) (D & T Comm)

LEARNING A change in the stable relationship between (a) a stimulus that the individual organism perceives and (b) a response that the organism makes, either covertly or overtly. (Berle)

LIBRARY (INFORMATION CENTER, AV CENTER, INSTRUCTIONAL MATERIALS CENTER) A function whose responsibility is to systematically collect and acquire information, classify it, store it and, upon demand, retrieve it and assist in adapting it to the use to be made of the information. (TerLouw)

LOGIC The process of determining by deductive reasoning, the means for obtaining a desired result from a given set of conditions. (IBM)

MEDIA, INSTRUCTIONAL See INSTRUCTIONAL MEDIA

MULTI-MEDIA APPROACH See CROSS MEDIA APPROACH

MULTISENSORY Pertaining to more than one of the human senses. (D & T Comm)

PERCEPTUAL LEARNING Learning which results from direct contact through the senses. (Kinder)

PROGRAMED INSTRUCTION The utilization of programed materials in achieving educational objectives. Synonymous with "auto-instruction, automated teaching," etc. (Markle) T-97

READ-OUT The operation of sensing and/or perceiving the DISPLAY. It is used either as a noun or a verb. Read-out can be an activity of an individual or a group. In the case of the group it can be simultaneous or distributed in time. Another variable is the special distribution of the group (all together or scattered in small groups in many locations). Task involvement during read-out is another consideration; act of responding to a DISPLAY by identifying information content and interpreting its significance.

REWARD A satisfaction-yielding stimulus or stimulus object that is obtained upon the successful performance of a task (which may be self or other-imposed). (English)

SEARCH The operation of determining whether certain information is in storage, the manner in which it is organized and where it is located. As information is stored in a wider diversity of forms the problem of search becomes increasingly complex. Another complicating factor is the need to include in the search procedure such considerations as the character of the audience for which the message is designed and the task it proposes to do. (TerLouw)

SEQUENCE A series of scenes, items, or experiences directly related by subject or by underlying thought. (D & T Comm)

SUBLIMINAL (1) Below the threshold; of stimuli that cannot be discriminated under the conditions of the experiment; (2) Of stimuli that are too weak to be specifically apprehended and reported but not too weak to be influential on conscious processes or behavior; or of the effects of such stimuli. (English)

SYSTEMS APPROACH An integrated, programed complex of instructional media, machinery and personnel whose components are structured as a single unit with a schedule of time and sequential phasing. (Its purpose is to insure that the components of the organic whole will be available with the proper characteristics and at the proper time, to contribute to the total system, and in so doing to fulfill the goals which have been established.) (D & T Comm)

SYSTEMS DESIGN (IN EDUCATION) Provides a conceptual framework for planning, orderly consideration of functions and resources, including personnel and technical facilities such as television, the kinds and amount of resources needed, and a phased and ordered sequence of events leading to the accomplishment of specified and operationally defined achievements. A systems approach should provide a way of checking on the relation of performances of all components to factors of economy and should reveal any inadequacies of the several components, including the faults of timing and consequently of the entire system. (Carpenter)

TELECOMMUNICATION Any transmission, emission or reception of signs, signals, writing, images and sounds of intelligence of any nature by wire, radio, visual or other electromagnetic systems. (D & T Comm)

TERMINOLOGY The system of terms, especially of technical terms, used in a given learned discipline, art, craft, or technology; or the study of the effectiveness of such a system. (English)

VERBALISM (1) Undue reliance upon words; the assumption that relationships suggested by facile habitual associations among words prevail in reality; (2) The uncritical acceptance of definitions as if they were explanations; (3) Wordy expression lacking meaning. (English)

VICARIOUS LEARNING Learning which is indirect or secondary, not firsthand. (Kinder)

1. (B) COMMUNICATION AND INFORMATION THEORIES

BINARY NUMBER SYSTEMS Compared with the usual decimal system--which has nine digits and a zero--the binary system has only one digit, 1, and a zero. Thus, the first ten whole numbers of the binary number system (with their everyday equivalents in parenthesis) are: 0 (0), 1 (1), 10 (2), 11 (3), 100 (4), 101 (5), 110 (6), 111 (7), 1000 (8), 1001 (9), 1010 (10). The binary number system is used in many electronic computers and in information theory. (English)

BIT A unit measure of amount of information; the bit is that amount which, put into a given assemblage consisting of a known number of alternative outcomes for a certain event, reduces the alternatives by one-half. (If we are tossing a coin, the chances of getting head or tail are even. To reduce the alternative by half, i.e., to specify that the coin will fall head, not tail, requires one bit of information. The formula is bit = $\log_2 k$, where k is the number of alternatives.) (English)

CHANNEL (INFORMATION THEORY) A complete system for transmitting a signal from an input location to an output location. (The channel includes the properties not only of the apparatus or equipment in the system, but of the code or language used. The channel may be an organism, in which case the sense organ is the input location and the motor mechanism is the output location. But it may also be purely mechanical, as is telephony; or it may be an institution such as a newspaper or news service, or any combination of physical, organic, and social transmitting media.) (English)

CODE An agreed transformation, or set of unambiguous rules, whereby messages are converted from one representation to another. (Cherry)

CODE CAPACITY The maximum possible rate at which information can be sent through a code channel. (English)

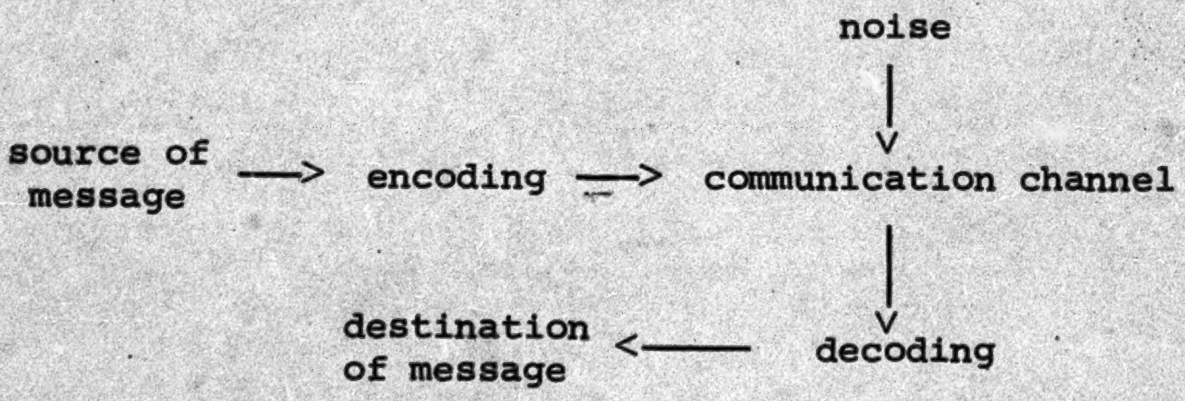
CODE CHANNEL A system whereby a sequence of signals related to a given code is transmitted at a given rate. (English) [illegible] An organism that interprets a sign produced by a communicator. (Morris)

COMMUNICATION (1) When restricted to signs, communication is the arousing of common . . . (significations) by the production of signs. It is language communication when the signs produced are language signs. Not all communication is language communication. (Morris) (2) The arousal of common meanings, with their resulting reactions, between communicator and interpreter through the use of signs and symbols. Communication is a social act and involves two or more persons in a field situation. In the face to face situation the roles of the communicator and interpreter are constantly shifting. In other situations there is less possibility for this interaction. (Fearing) (3) The establishment of a commonage of significations ("Meanings") by the production of signs. It is language communication if the signs are language signs. (Adaptation from Morris by Knowlton)

COMMUNICATION/HUMAN (1) (Communications Theory) The subscience that investigates the relations between persons who select messages (sources) and persons who interpret and are affected by them (destinations); (2) The study of mass media of communication and their effects on mass audiences, other cultures, etc. (This usage somewhat arbitrarily restricts the meaning of the term.) (English)

T-101

COMMUNICATION MODEL (C. E. Shannon) A display of the steps or stages in a communication:



(English)

COMMUNICATION UNIT (Communications Theory) A complex unit consisting of source, transmitter, receiver, and destination. (In the model for human communication the source and the destination are persons. The former selects messages and by means of the transmitter--the motor system of the individual--encodes the message and starts it on its way through the communication channel in the form of signals--words, gestures, etc. These signals are picked up by the receiver--a sense organ and its brain connections--of the person who is the destination.) (English)

COMMUNICATIONS THEORY A technology (not a theory) that deals with communication in all its aspects--physical, psychological, sociological. (The parallels between processes of communication in machines, organisms, and institutions are described; and common terms for parallel processes are invented or adapted from old ones.) Since INFORMATION is what is communicated, there is much overlap with INFORMATION THEORY. (English)

COMMUNICATOR An organism that produces a sign that is a stimulus in social behavior to some organism (the communicatee). (Morris) T-102

EFFECTS ANALYSIS The techniques of determining in objective and quantitative terms the effects of particular communications content on interpreters. Such analysis is always made after the interpreters have been exposed to the content. A variety of special techniques are used including information and attitude tests, and interviewing. (Fearing)

ENCODING (1) Process whereby a message is transformed into signals that can be carried by a communication channel; (2) Process whereby a person transforms his intention into such behavior as can be a signal in a communication system. (The usual behaviors are oral or graphic language, but gestures, etc., may also serve) The entire encoding may involve several steps, e.g., a person writes out a telegram (first encoding) which is in turn transformed by another into electric signals (second encoding). (English)

ENTROPY The measure of unavailable energy in a thermo-dynamic system. By analogy, it refers to the information rate of a source of messages. Information tends to narrow the range of probability. In holding a direction opposite to that of randomness, information thus resembles negative entropy. (Adapted from Cherry and F. Allport by Knowlton)

FEED BACK (COMMUNICATIONS THEORY) Refers to a fundamental property of any dynamic system, viz., the interdependence of parts. As one part of a system increases or decreases in some respect (such as speed), another part of the system with which it is dynamically interrelated, correspondingly changes its operation (e.g., speed). This latter change, in turn, has effects on the former, etc. The system may be such that an increasing "output" so affects "input" as to in turn decrease "output" (negative feedback); or the opposite (positive feedback).

Feedback loops of concern are linguistic statements and expressive gestures--in fact anything that indicates to the communicator the manner in which the communicatee responds to his message; and anything that indicates to the interpreter the intent of the communicator in producing the message. (Knowlton)

ICONIC SIGN A sign is iconic to the extent that it resembles or has the properties of the object, event or situation for which it is a sign. If the words "cat" and "meow" are both signs for the object, cat, then "meow" may be said to be more iconic than "cat." (Fearing)

INFORMATION (Information Theory) A purely quantitative property of an ensemble of items that enables categorization or classification of some or all of them. (English)

INFORMATION THEORY (1) An interdisciplinary study (not a theory) dealing with the transmission of MESSAGES or SIGNALS, or the communication of INFORMATION. (It draws upon COMMUNICATIONS THEORY--which includes much from physics and engineering, linguistics, psychology, and sociology.) (English) (2) The study of the communication process in all its aspects. It is a body of mathematical results concerning a quantity called INFORMATION which is a measure of the amount of knowledge contained in a proposition or a message. (IBM)

INPUT (Communications Theory) The energy entering a system from without; in a communications system, that which acts on a receiver. (English)

LANGUAGE A set of symbols whose "meanings" are shared by or common to the group of interpreters whose language it is. The symbols are producible by the interpreters and are formally combinable in some ways and not in others (grammar). Language appears only in a social context. (Fearing)

MEDIATOR In communication theory the system that intervenes between the receiver and the transmitter. It combines the function of destination and source. (English)

MESSAGE In communication theory, an ordered selection from an agreed set of signs intended to communicate information. (Cherry)

NOISE (1) Disturbances which do not represent any part of the messages from a specified source. (Cherry) (2) Anything that introduces extraneous variability into a communication process, or that raises the entropy or reduces the information--i.e., difference between input and output generated by random error in the communication system itself. (English)

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OUTPUT (COMMUNICATIONS THEORY) The signal emitted by a source; in the case of an animal, overt behavior which acts as a signal for another animal or which acts upon a nonliving communication system. (English)

PSYCHOLINGUISTICS The study of the relations between communications or messages and the characteristics of the persons who communicate; specifically, the study of language as related to the general or individual characteristics of the users of language. (English)

RECEIVER (COMMUNICATIONS THEORY) That which transforms a signal into a message. (English)

REDUNDANCY OR T FUNCTION (Information Theory) That property of a message which reduces the error of prediction for a given event to less than chance by virtue of the fact that the message contains information about what will come next. (English)

REDUNDANCY (of a SOURCE) (Information Theory) Broadly, a property given to a source by virtue of an excess of rules (syntax) whereby it becomes increasingly likely that mistakes in reception will be avoided. (Cherry)

REFERENT That which a sign "refers to," or "stands for," or denotes, more especially when this is a physical or imagined thing, event, quality, etc. (Cherry)

SEMANTICS (1) The science of meanings of words or other signs; the rules that describe the way signs relate to objects; (2) General semantics: the study of human responses to signs and symbols. (English)

SEMIOTIC The science of signs. Its main subdivisions are semantics, syntactics, and pragmatics. Each of these, and so semiotic as a whole, can be pure, descriptive, or applied. Pure semiotic elaborates a language to talk about signs, descriptive semiltic studies, actual signs, and applied semiotic utilizes knowledge about signs for the accomplishment of various purposes. (Morris)

SIGN (Noun) (1) In general, an indicator (see SIGNAL, SYMBOL); (2) Any object or event--especially an action, or the direct result of an action--perceived as having a significance beyond itself; e.g., the blush of embarrassment, the slouched posture of fatigue or boredom; (3) A stimulus that substitutes for another in evoking a response--e.g., the conditioned stimulus in classical conditioning; (4) A conventional gesture standing for a word or words, or for an idea; e.g., nodding for "yes," the sign language of the deaf. (English) T-105

SIGNAL A SIGN communicated by one person to another in order to indicate that the time and place for a certain action are at hand. (English)

SIGNIFY To signify is to act as a sign in a process of semiosis. "To have signification" and "to have a significatum" are synonymous with "to signify." A sign is said to signify (but not denote) its significatum, that is, the conditions under which it denotes. All signs signify; not all signs denote. (Morris)

SOURCE (of MESSAGE-SIGNALS) That part of a communication channel where MESSAGES are assumed to originate (where selective action is exerted upon an ensemble of SIGNS) (Cherry)

STIMULUS A technical term in psychology designating a class of events which impinge on an organism's sensory equipment and which experimenters can manipulate, describe, or hypothesize to exist. Stimuli are linked as observable (or hypothesized) antecedents to specific responses. In S-R (stimulus-response) psychology, the stimulus is a necessary antecedent to a response. Skinner's position places more emphasis on the consequent (reinforcing) stimuli than on the antecedents. In a program, the content of the item is the stimulus. This includes the terminal stimulus (the bare bones of the question or statement), any additional stimuli operating as prompts or models, and any external material such as panels. (Markle)

SYMBOL A symbol is a substitute for a sign with which it is synonymous. Symbols are producible by the person using them with the intent of modifying the behavior of other persons in a specific direction. For effective communication the symbol must have the same meaning for the user as for the interpreter, that is, the user of the symbol implicitly or explicitly reacts to it in the same manner as its interpreter. In this connection the communicator's intent, which is a private affair, is effected only when there exists this commonality of meaning. Whether or not symbols have the same meanings for communicator and interpreter is a major area of communication study and must never be taken for granted. (Fearing)

SYMBOLISM Representation of things, ideas, or meanings by signs, labels, conventions, or words. Usually used to express abstract ideas. (Kinder)

SYNTACTICS That branch of semiotic that studies the way in which signs of various classes are combined to form compound signs. It abstracts from the signification of the signs it studies and from their uses and effects; hence, it is distinguished from semantics and pragmatics. (Morris)

TRANSMISSION (COMMUNICATIONS THEORY) The processes by which a message passes from the input to the output; or the average amount of information coming from the input which reaches the output. (English)

TRANSMITTER (COMMUNICATIONS THEORY) Any means by which a message is encoded and started on its way through a channel. (English)

1. (C) TECHNOLOGICAL DEVELOPMENTS

ACCESSION A library term describing all the administrative work necessary to receive, inspect, catalogue, mark and identify, and place in storage for distribution. (Gordon)

AIRBORNE TELEVISION See STRATOVISION

AUTO-INSTRUCTIONAL DEVICES (1) The technology of machines and systems devoted to mass instruction, including various applications of television and the massed film systems, such as EBF's physics and chemistry series; (2) Those systems and machines for individual instruction, which include individual reading pacers, individual viewing and listening equipment, language laboratories, programed printed materials, and the true teaching machine of the Skinner or Pressey type, using verbal and pictorial programs with various ways, electronic and mechanical, for responding and being informed of errors and progress. (Finn)

AUTO-INSTRUCTIONAL METHODS Synonymous with "programed instruction, programed learning, automated teaching, self-instructional materials," etc. The term "auto-instructional" was proposed by Lumsdaine and Klaus to circumvent "misleading, prejudicial, or both" connotations attributed by them to the other labels. The teaching machine would be called an "Auto-Instructional Device" (AID). (Markle) T-108

CLOSED-CIRCUIT TELEVISION A modified type of television in which the signals are transmitted by coaxial cables instead of sound waves. These telecasts are limited in range and, since they are not broadcast on the air waves, no license is required. (Kinder)

COMPUTER A device which can accept information and supply information. The supplied output information is derived from the accepted input information. (IBM)

CROSS MEDIA APPROACH Methodology based on the principle that a variety of audiovisual media and experiences correlated with other instructional materials overlap and reinforce the value of each other. Some of the material may be used to motivate interest; others, to communicate basic facts; still others, to clear up misconceptions and deepen understanding. Same as MULTI MEDIA APPROACH. (D & T Comm)

ELECTRONIC LEARNING LABORATORY Basically, a series of tape recorders, earphones, and microphones, connected by wire to a console where switches permit the instructor to communicate with (1) all students simultaneously; (2) groups of selected students, and (3) one student, individually.

The instructor may also distribute a single tape to all students or several, different master tapes to selected individuals. In some laboratories each student may have his own individual master tape to which he listens, orally responds and sometimes (according to instructions) records his oral responses. Most electronic laboratories place the tape recording mechanism at the student's desk. Each desk is isolated by sound dampened panels. In addition, the student is provided with a microphone and earphones. Recently, remotely controlled recorders, boom microphones fastened to the earphones headset along with the elimination of isolation panels have been installed to provide improved instruction. Supplemental studies demonstrate that greater efficiency is provided when visual materials are presented to either the entire group or to each student individually.

Experimentation since 1958 has provided evidence that these facilities can be utilized effectively for the teaching of foreign languages; reading; spelling, grammar and punctuation; music appreciation and criticism; English literature; social studies; stenography; and speech. (Oxhandler)

HUMAN ENGINEERING (1) An applied science, participated in jointly by psychologists and engineers, concerned with the design of equipment and the arranging of the physical conditions of work in relation to human sensory capacities, psychomotor abilities, learning capacities, body dimensions, comfort, safety, and satisfactions; (2) The art of managing men as the engineer manages materials. (English)

INFORMATION RETRIEVAL The process of storing large quantities of information and selectively retrieving this information under computer control. (IBM)

INSTRUCTIONAL TELEVISION or ITV Any closed-circuit or broadcast television program which provides formal instruction, usually for credit. (See also EDUCATIONAL TELEVISION or ETV.) (D & T Comm)

KIT A collection of pertinent materials gathered and integrated into an instructional unit, e.g., a textbook, filmstrips, tape recordings integrated into one basic unit. (For more recent and complex applications of this concept, see SYSTEMS APPROACH and SYSTEMS DESIGN.) (D & T Comm)

MULTI-MEDIA APPROACH See CROSS MEDIA APPROACH

PROGRAMED INSTRUCTION The utilization of programed materials in achieving educational objectives. Synonymous with "auto-instruction, automated teaching," etc. (Markle)

REMOTE CONTROL Mechanical and/or electrical installation which make possible the control, operation, and adjustment of such devices as projectors, cameras, tape recorders, electronic learning labs, audio and video systems in adjacent or remote areas by means of special switches and electrical relays. (D & T Comm)

RETRIEVE (RETRIEVAL) When a message is stored it is obvious that certain operations must be carried out to ready it for being displayed. These operations constitute the act of retrieval. This act includes such operations as initiating the retireval operation and transportation from the point of storage to the point of display. (TerLouw)

SATELLITE COMMUNICATION The use of one or a series of orbiting man-made satellites which are equipped to receive, amplify, and re-transmit (or merely reflect from its surface) microwave signals from and to specially-adapted transmitters and receivers several hundred or thousand miles apart; first experimental application for transmission of radio, television, and telephone signals between Europe and the United States made by Telstar satellite in July 1962. (D & T Comm)

SOLID STATE ELECTRONICS Term used to describe a special type of small electronic component, such as transistors, which have no lighted or heated filament and which can be used instead of vacuum tubes in most electronic circuits. (USOE)

SOLID STATE LOGIC Utilization of solid state devices to perform logical functions as opposed to vacuum tube devices. (IBM)

STORE (STORAGE) The interval between the creation of the message as a unit or organized data or information and its presentation to the senses or the individual. In direct speech or a live demonstration the delay is zero. However, both events can be stored for delayed read-out by appropriate methods. The information loss characteristic of the storage system is a factor to be considered. Space occupied by the stored information is another significant factor. (TerLouw)

STRATOVISION The use of high-flying aircraft to retransmit programs originating from ground base stations or to transmit directly from video tape systems. (Latter is employed by the Midwest Program on Airborne Television Instruction.) (D & T Comm)

SYSTEMS APPROACH An integrated, programed complex of instructional media, machinery and personnel whose components are structured as a single unit with a schedule of time and sequential phasing. (Its purpose is to insure that the components of the organic whole will be available with the proper characteristics and at the proper time, to contribute to the total system, and in so doing to fulfill the goals which have been established.)

SYSTEMS DESIGN (IN EDUCATION) Provides a conceptual framework for planning, orderly consideration of functions and resources, including personnel and technical facilities such as television, the kinds and amount of resources needed, and a phased and ordered sequence of events leading to the accomplishment of specified and operationally defined achievements. A systems approach should provide a way of checking on the relation of performances of all components, including the faults of timing and consequently of the entire system. (Carpenter)

SYSTEMS ENGINEER Studies problems in industry, science, business and government, and then organizes electronic data processing techniques and machine systems to solve them. He works at the source and with management in the organization concerned. (IBM)

TEACHING MACHINE A device for presenting a program. Most machines control the material to which the student has access at any moment, preventing him from looking ahead or reviewing old items. Many machines contain a response mechanism; a tape on which the student writes, a keyboard, or selection buttons. Some provision is made for knowledge of results, either by revealing the correct answer after the student responds or by advancing to the next item, thereby signaling correct completion of the previous item. A few machines score the student's response and tabulate errors. Machines are being developed which will select the next step on the basis of the student's response. This type of machine, in a combination with a branched program, comprises what Stolurow calls an ADAPTIVE TEACHING MACHINE.

In Porter's terminology, a teaching machine is a STIMULUS-RESPONSE DEVICE providing immediate reinforcement. Such machines are distinguished from (1) STIMULUS DEVICES, such as films, phonographs, which present information but make no provision for responses from the student, and likewise from (2) RESPONSE DEVICES, such as typewriters which provide for practice but not for controlled input of information. A teacher may provide the missing half of either a stimulus device or a response device. (See PRESSEY DEVICE and SKINNER DEVICE.) (Markle) T-112

TEAM TEACHING Restructured system of education, especially in elementary schools, where a team of teachers supervised by a team leader work with large groups of students, and smaller combinations for more specialized teacher-student interchange. Provides for fuller utilization of teachers talented in specific subject areas, freer exchange of ideas and evaluation, and often with the assistance of an aide, more thorough class preparation and application of audio-visual communication media and techniques. (D & T Comm)

TECHNOLOGY (1) A systematic body of facts and principles related to a comprehensive, practical and useful end. The term is not limited to industry or engineering. The principles of effective teaching (pedagogy), for example, comprise a technology. (2) The actual processes of manufacture in a given industry or plant. (English)

TELECOMMUNICATION Any transmission, emission or reception of signs, signals, writing, images and sounds of intelligence of any nature by wire, radio, visual or other electromagnetic systems. (D & T Comm)

TELEMATION A complex of existing devices combined into one rather intricate instrument which includes a wall-sized panel of three (or more) translucent screens; a tape recorder, movie projector, three transparency projectors and one opaque projector--all situated behind the screens; an instructor's lectern; and push-button control panel for operating the equipment. Can be programed on a punched tape for automatic presentation. (D & T Comm) (See also TELEPROMPTER)

TELEPROMPTER A mechanical "cue" feeder to television actors (or teachers) has been broadened and developed into one of the effective mechanical aids available to speakers (or lecturers).

Large typed words, eight times the size of regular typewriter type, unroll through a compact unit in front of the speaker. The typed words, on a long roll of paper enter the speaker's field of vision at a rate of speed controlled by either the speaker or an assistant.

It is possible to go back in the speech or go forward at an accelerated rate if the occasion demands.

Using more than one unit in synchronization, the speaker can apparently look the audience in the eye as his eyes travel back and forth from the multiple teleprompters placed to the left and right of the lectern.

By incorporating a set of solenoid switches in one of the teleprompters and placing thin strips of adhesive-backed aluminum foil on the roll of teleprompter paper at the cue words, to activate the switches, recorders, projectors, and room lights can be turned off and on in synchronization with the speaker's delivery. (ANA) (See also TELEMATION)

THERMOPLASTIC RECORDING A process which combines the processing speed and versatility of magnetic recording and the storage capacity of photography; it can concentrate 100 times as much information in a given space as can magnetic recording. It records almost instantaneously and will produce pictures in color or black-and-white, but does not require chemical processing and can be erased and reused as desired. Presently under experimental development by General Electric. (D & T Comm)

TRUMP PLAN A system of instruction, more particularly secondary education, or curricular organization, in which the methods of teaching, student groupings, scheduling, and teacher and pupil activities adjust to the purposes and content of instruction. Three basic learning structures utilized are large-group instruction, small-group instruction, and individual instruction. (D & T Comm)

2. VISUAL MEDIA (PROJECTED AND NON-PROJECTED)

ACETATE FILM Shortened term for cellulose acetate, the chemical base used in safety film. Practically all 8mm and 16mm film is acetate, as is the 35mm film used in 2" × 2" slides and filmstrips. (Kinder)

ANAMORPHIC LENS A lens designed to distort an image in a systematic way, usually by means of an element or elements having cylindrical rather than the usual spherical surfaces. Such a lens usually is designed to compress the image along one axis of the focal plane, leaving the image unaffected in the focal plane direction at 90° from that axis. The object usually is to obtain a wide-screen image by projecting such a picture through a correcting lens having the same characteristics as the lens used on the camera. (UFPA)

APERTURE An opening in the lens system of a camera through which light passes from the scene through the lens to the film. In a projector, light passes through the aperture to the film and thence to the screen. This aperture also "frames" the film image. In a camera, the aperture may be adjusted by means of an iris to vary the size of the lens opening, thus affecting the amount of light which strikes the film (assuming the same exposure time). (Brown)

APERTURE GATE The part of a motion picture projector consisting of the aperture plate, which determines the exact framing of the image on the screen, and the aperture shoe, a pressure shoe that holds the film snugly against the aperture plate during projection; not to be confused with "camera gate," the motion picture framing device. (Gordon)

BEADED SCREEN A projection screen whose surface consists of innumerable minute glass beads. At a limited angle it gives a high quality reflection. (D & T Comm)

BLUE-LINE PRINT (1) A positive print with a blue image usually produced by the diazotype process; (a) Also used to designate a blueprint with blue lines on a white field, made by printing from a negative master. (NABDC)

BLUEPRINT PROCESS Reproduction method using light-sensitive iron salts, which produces a negative blue image from a positive master. (NABDC)

CARBON ARC PROJECTOR Type of projector illuminated by an electric spark between two rods of carbon; projector with a hot bright light. (Kinder)

CHALK TALK A visualized presentation written or drawn on a chalkboard and accompanied by narration. The drawings are usually essential to the chalk talk. A chalk talk is frequently used to supplement lectures or discussions. (Cross)

CHALKBOARD A board, the surface of which may be made of slate or plastic or treated wood, upon which one may write or draw with chalk. (See also MAGNETIC BOARD) (Cross)

COLOR (1) Photography in natural color, as compared with photography in black and white; (2) The psychological sensation arising as a result of ocular perception of, and discrimination between, various wavelengths of light; (3) Any feature incorporated in a scene for the sake of its contribution to the authenticity of the scene. (UFPA)

COMPOSITION In photography and art, composition refers to the planned arrangement of items or objects which make up the picture. (Kinder)

CONDENSING LENS A lens which serves to gather the light rays from a source and to condense or concentrate them. (Kinder)

CONTINUOUS LOOP Two open ends of a short length of film, five or six feet, spliced and threaded into a projector. The film is then projected over and over. Longer film length, several minutes or more, requires a special projector or adapter so that the film will be automatically rewound as it comes through the projector. (Kinder)

CROPPING To trim or cut off parts of the picture, to eliminate superfluous portions and thus improve composition. (D & T Comm)

CUTAWAY A real object or a model, made to scale or magnified, in which the other covering or a portion has been wholly or partially removed so as to reveal the inner structure or framework or working parts. (Cross)

DAYLIGHT SCREEN A projection screen so constructed that clear images from a projector are visible in an undarkened room; BEADED AND LENTICULAR SCREENS are often placed in this category. (D & T Comm)

DEFINITION Appearance of sharpness or of being in focus in an image. (Lewis)

DENSITY Defined as the logarithm of the opacity In general terms, the relative darkness of an image area. (NABDC)

DIAZO Light-sensitive component of diazotype materials which reacts with couplers to form axo dyes. (NABDC)

DOCUMENTARY The term to describe the type of motion picture or television program that purports to show reality and in which techniques are secondary to the theme. (Gordon)

DOUBLE FRAME Term applied to a 35mm filmstrip on which the pictures are photographed so that the width of the picture is lengthwise on the film. Double frame pictures are 1½" × 1" and the film is inserted in the projector horizontally. (Kinder)

DRY MOUNT A picture mounted by use of a thermal-seal process. (Kinder)

DUPLICATING Creating an exact (or nearly exact) copy of a recording, a drawing, a printed page etc. (Cross)

ELECTRIC BOARD A generic term applied to numerous devices created to test, drill, or demonstrate; usually features an electrical circuit which activates a buzzer, bell, or light when appropriate contacts or switches are manipulated in response to questions or pictorial materials displayed on the board. Also called a "buzz board." (Brown)

ETCHED GLASS Type of glass used for slide making which has one side etched or ground to give a milky or opalescent effect. (Kinder)

EXCITER LAMP An incandescent lamp used to supply luminous energy to a photoresponsive cell, such as the photocell in a motion picture projector. Interposition of a variable mask or matte, such as a sound track, in the optical path between the exciter lamp and the photocell then results in corresponding variations in the electrical response of the photocell. (UFPA)

FACSIMILE An electronic system for transmitting pictures and graphic materials over very high frequency air waves. (Kinder)

FELTBOARD A type of display board made of cardboard or thin wood and covered with felt or similar cloth. Pictured symbols to be displayed on it are backed with similar materials and adhere to the feltboard. (When flannel is used, referred to as a "flannelboard.") (Cross)

FILM LOOP See CONTINUOUS LOOP

FILM, SILENT A motion picture film on which no sound track has been recorded. Generally, silent film is 16mm and has sprocket holes on both edges. "Silent speed" for projection of 16mm is 16 frames per second. (Brown)

FILM, SOUND A motion picture film with self-contained sound track (optical or magnetic). A 16mm sound film has sprocket holes on one edge only. Projects properly at 24 frames per second. (Brown)

FILM, TRAINING A film produced with an instructional objective; may be synonymous with "educational" or "instructional" film. Sometimes conceived to be a film solely for instruction in skills. A military term for instructional films. (Brown)

FILMOGRAPH A "motion" picture made by photographing motionless subjects with a motion picture camera. (Kinder)

FILMSTRIP (Also variously called "strip film" and "slide film.") A length of 35mm or 16mm film containing a succession of still pictures, intended for projection one at a time in the same way as slides are shown. Some filmstrips are equipped with a tape or a recording that contains not only the narration but also a subsonic signal that activates a solenoid, thus advancing the filmstrip to the next picture on cue. (Gordon)

FILMSTRIP PROJECTOR Projection instrument designed to accept 35mm filmstrips, virtically if SINGLE FRAME or horizontally if DOUBLE FRAME; often equipped with an adapter to accept slides. Models available with manual advance and/or remote control. (D & T Comm)

FILMSTRIP, SOUND See FILMSTRIP

FLANNELBOARD See FELTBOARD

FLANNELGRAPH See FELTBOARD

FLASH METER See TACHISTOSCOPE T-119

FLAT PICTURE A flat picture is a representation, a visual likeness, of persons, places, and things. It is a two-dimensional representation and may be an actual photograph or any one of the following: postcard, sketch, half-tone, print, lithograph, mural, cartoon, comics, poster, photograph. (Even maps, charts, and graphs are considered as pictures designed to show relationships.) (Cross)

FLIP CHARTS An integrated easel graphic presentation that is hinged together into a unit. Their name came from the fact that you "flip" the separate sheets over the top of the unit into or out of view as you progress in the presentation. They are usually associated with tabletop presentations, rather than large audience groups. (ANA)

FLOCKING Term which comes from "flock," meaning small tufts of wool or hair, or wool refuse. In FELTBOARD use, flocking refers to a backing for cut-outs, usually a mass of flakes or fibres sprayed from a can or gun. These are usually synthetic flakes which stick to paper and will adhere to felt. (Kinder)

FLUORESCENT CHALK A type of chalk that becomes luminescent in a darkened room under special ultra-violet lighting. (Kinder)

FOIL Term used to refer to the sensitive plastic sheets used in ammonia-type printing. (Kinder)

FOOT CANDLE The illumination falling on a spherical surface one foot distant from a point light source of one standard candle intensity. Also expressed as the illumination on a surface one foot square when the uniformly distributed luminous flux has a value of one lumen. (UFPA)

FOOTAGE In the United States and some other countries, length of motion picture film is usually expressed in the English system, with the foot as the basic unit. Width, or gauge, of film, however, is universally expressed in the metric system. (UFPA)

FRAME An individual picture in a series of pictures, as in a motion picture film or filmstrip. (D & T Comm)

FRAME See ITEM T-120

FRAME, DOUBLE See DOUBLE FRAME

FRAMER A button, lever, or knob that controls centering of frame of film in the aperture of a motion picture or filmstrip projector. (Brown)

GATE, FILM A mechanism covering the film channel of a motion picture (or filmstrip) projector. The gate may be opened to insert or remove the film from the projector or to clean the film channel, guides, pressure plate, and aperture. (Brown)

GRAININESS In photography, a defect characterized by poor uniformity of color distribution, more or less in the pattern of small dots or grains, amplified by enlargement. (D & T Comm)

GRAPHIC COMMUNICATION The preparation, presentation and interpretation of static, two-dimensional, symbolic visual material. (The word "symbolic" is included to indicate that most graphics are representations of the original, and the presentation of the actual originals themselves.) (Langston)

HALF-TONE Method of simulating continuous tone by breaking an image into dots of equal density but variable area. (NABDC)

HUE That quality of a color related to the wave length of light which the color reflects. (NABDC)

IMAGE REPRODUCTION The controlled visual recreation or duplication of an animate or inanimate process or material through a chemical, ultraviolet, mechanical, graphic, photographic, electronic scanning, or other process; e.g., an overhead transparency, photograph, printed page, motion picture, radio facsimile, or television transmission. (D & T Comm)

KEYSTONE EFFECT An out-of-square image on a projection screen, resulting when the plane of the screen and the plane of the projected material are not parallel to each other. (Brown) T-121

KINESCOPE The kinescope is the picture tube of a television receiver. However, recently the term has been applied to motion picture films made by photographing the images produced on the "kinescope," or picture tube. (Cross)

LANTERN SLIDE Mounted 3¼" × 4"(and occasionally 2¼" × 2¼") slide, glass enclosed, which may be handmade with pencil, crayon, or inks, or on special materials or photographically processed. Their larger transparent surfaces (see ETCHED GLASS) have made lantern slides the most popular teacher-student produced projection medium until the advent of the overhead TRANSPARENCY. (D & T Comm)

LANTERN SLIDE PROJECTOR Projection instrument designed to accept standard 3¼" × 4" lantern slides, and occasionally 2¼" × 2¼" slides, with the provision of a special adapter. This projector, still popular, was the forerunner of the SLIDE PROJECTOR AND FILMSTRIP PROJECTOR. (D & T Comm)

LAYOUT Visualized plan for a display, poster, bulletin board, publication, or chalkboard presentation. Usually done to scale and with sufficient detail to indicate how the final product will appear. (Brown)

LENS, ANAMORPHIC See ANAMORPHIC LENS

LENS, CONDENSING See CONDENSING LENS

LENTICULAR SCREEN A silver projection screen with tiny corrugations on its surface to increase the brilliance of the image. (D & T Comm)

LIGHT CONTROL A term used by architects to identify methods of regulating light from sources outside a room. In audiovisual terminology, light control, in addition, includes the features by which rooms are darkened for projection. For clarification, it is recommended that both terms, "light control" and "room darkening" be used. (Brown)

LOOP In motion picture projection, the word "loop" refers to a slack portion of the film immediately above and below the "gate" area; permits the film to move intermittently without being damaged. (Brown) T-122

MAGAZINE A container for film, tape, slides or filmstrips, usually embodying a transport mechanism, designed to supply or present the material for controlled exposure. Most magazines are built to integrate with specific equipment, with drive mechanisms mechanically coupled. (D & T Comm)

MAGNETIC BOARD A sheet of metal to which objects may be attached by means of magnets. This same surface may be coated with paint or enamel and used as a chalkboard. (See also CHALKBOARD) (Cross)

MAGNETIC FILM A sprocketed synchronous acetate base with a magnetic coating that is available from stock in 35-, 17½-, 16-, and 8mm sizes. Characteristically, the film resembles the commonly known ¼" tape varieties, but through the use of sprockets it can be synchronized exactly to film. (Gordon)

MAGNETIC SOUND PROJECTOR A motion picture projector capable of showing motion picture film which has either an optic or magnetic sound track. (Kinder)

MASK In photography, a mask is a frame of cardboard or other substance used to confine the picture area of slides or transparencies, and to give support to the projection material in the slide. (Brown)

MASKING Protecting part of a light-sensitive layer by an opaque shield during part of an exposure. (NABDC)

MATTE FINISH Dull, gloss-free surface finish. (NABDC)

MATTE SCREEN Projection screen with flat, even surface and dull finish which provides an even brilliance at all viewing angles; most effective in well-darkened viewing areas. (D & T Comm)

MICROCARD A card on which a large volume of printed materials has been condensed to extremely small size by photographic processes. Microcard material is read with the aid of a microcard reader, which magnifies the minute writing. (Cross)

MICROFILM Film upon which, by photographic processes, printed and other materials are reproduced. The minute images on the film are observed through a special magnifying viewer or by projection. (See MICROFILM READER) (Brown)

MICROFILM READER Apparatus with a built-in screen or viewing glass arranged to magnify microfilm so that it can be read comfortably at eye distances and without the use of hand magnifying glasses. (Kinder)

MICRO PROJECTOR A special projector designed to enlarge and project microscopic transparencies (such as microscope slides or sections of microfilms) for viewing by whole classes or even large audiences. (Cross)

MOCK-UP A representation of the real thing, constructed so as to emphasize the particular part or function of the real thing. It may be smaller or larger than the original; certain features may be made so as to give emphasis to functions or relationships. (Cross)

MODEL A scale replica or representation of reality. The scale may be miniature, exact size, or enlargement, and the model itself may or may not be manipulative. (Cross)

OBJECTIVE LENS The lens or system of lenses which forms the primary image in an optical system. (D & T Comm)

OPACITY The ratio between the amount of light incident upon a transparent surface and the amount of light transmitted by that surface. Opacity is the reciprocal of transmission, and its log is equal to density. (UFPA)

OPAQUE That property of being impervious to light and non-transparent. (NABDC)

OPAQUE PROJECTOR A projector which can project small opaque images, such as maps, pictures or printed pages, onto a screen as enlargements. (Kinder)

OVERHEAD PROJECTOR A projector which throws a highly-illuminated image on the screen by reflection from a mirror; it is placed in front of the audience and may be used in a semi-darkened or completely lighted room; utilizes 3¼" × 4", 7" × 7" and 10" × 10" transparencies and specially prepared objects which may be produced and presented in a variety of ways. (D & T Comm)

OVERLAY Group of transparent or translucent prints used to form a composite print or slide. (NABDC)

PANTOGRAPH (GRAPHICS) A device for mechanical duplication of drawings or designs in enlarged or reduced scale. (Brown)

PHOTOCOPYING A process whereby duplicate copies of hand-drawn or printed materials, including pictures, are made by automatic photocopying machines. (Kinder)

PHOTOELECTRIC CELL A small device designed to generate minute electrical currents when exposed to light. In sound motion picture projectors, the cell reacts to the light from the EXCITER LAMP. (Cross)

PHOTOGRAM A picture taken on photographic paper, but without the aid of a camera. (Kinder)

PHOTOPLAY A motion picture made from a play or drama, such as "Richard III" or "Helen of Troy." The term has been used loosely to include almost any major or "Class A" motion picture production. (Kinder)

PHOTOSTAT Trade name of a camera which makes copies of documents, letters, drawings, etc., on sensitized paper; also the generic term for copies made by means of this or a similar camera. (See also PHOTOCOPYING) (D & T Comm)

PLATEN The flat surface or platform in the opaque projector on which materials to be projected are placed. (D & T Comm)

POLARIZED PROJECTION See STILL MOTION SLIDES

PRINTING Making positives from a negative either by contact or by projection. (D & T Comm)

PROJECTION, REAR-SCREEN See REAR-SCREEN PROJECTION

REAR-SCREEN PROJECTION The projector, located behind a translucent screen, is placed in front of the viewers. May be housed in a self-contained unit or in a projection room. A mirror or mirror system adapted to the projector reverses the image from left to right. (Also referred to as "indirect projection" since the mirror system bends the projection beam.) (D & T Comm)

REEL (MOTION PICTURE) The standard unit of film length when referring to a completed production. It is a one-reel or two-reel film. A reel consists of 360 feet of 16mm film or 900 feet of 35mm film, requiring ten minutes of screen time. Release prints are always maintained on reels, whereas stock footage (original and print) is maintained on cores. (Gordon)

REEL, SUPPLY Reel which supplies film or tape as it is being recorded or played back. Also called "feed reel." (D & T Comm)

REEL, TAKE-UP Reel which receives film or tape as it is being recorded or played back. (D & T Comm)

REWIND (1) (Verb) Act of returning recording tape or projection film from take-up reel to supply reel after playback or projection; (2) (Noun) Unit, often built into recording or projection equipment, which, when threaded and electronically (or manually) activated, returns material to the supply reel. (D & T Comm)

ROOM DARKENING See LIGHT CONTROL

SHUTTER In a motion picture camera, the mechanical device which shields the film from light at the aperture during the film movement portion of the intermittent cycle. Also, a similar device in projectors for cutting the projection light during the time the film is moving at the aperture. (UFPA)

SINGLE FRAME Term applied to a 35mm filmstrip on which the pictures are photographed so that the width of the picture is crosswise on the film. Single frame pictures are ¾" × 1" and the film is inserted in the projector vertically. (Kinder)

SLIDE Term most frequently used for 2" × 2" and 2¼" × 2¼" mounted transparencies. The 3¼" × 4" size is termed LANTERN SLIDE; larger 7" × 7" and 10" × 10" sizes are usually termed TRANSPARENCY, and are designed for OVERHEAD PROJECTOR use. (D & T Comm)

SLIDE PROJECTOR Projection instrument designed to accept 2" × 2", 2¼" × 2¼", and 3¼" × 4" mounted transparencies; slides may be advanced individually or on a slide cartridge through manual or remote controls. Projectors which accept the 3¼" × 4" slides exclusively are usually referred to as LANTERN SLIDE PROJECTORS. (D & T Comm)

SOUND DRUM The portion of the mechanism of a sound motion picture projector around which the film passes at the point where the sound is picked up. The sound drum is usually attached to a flywheel to stabilize the movement of the film through the projector at this point. (Brown)

SOUND TRACK The portion of the motion picture film on which the sound is recorded, normally one band in 16mm along the edge opposite the sprocket holes. It may be optical or magnetic, or both, and with stereo sound may have two or more tracks. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Gordon)

SPEED, SILENT See FILM, SILENT

SPEED, SOUND See FILM, SOUND

SPONSORED FILM Any film whose production costs have been borne by someone or a company for the purpose of exhibiting the film free of admission charges (or rental costs); it is intended to accrue credit or prestige to the sponsor. On occasion, sponsored films are shown in locations where an admission fee is charged. (Gordon)

SPROCKET HOLES Holes along the edge of film that engage teeth in sprocket wheels. Sprocket wheels turn to advance film through the projector (or camera). (Brown)

STEREOGRAPH Picture prepared for use in a stereoscope. (Kinder) T-127

STEREOSCOPE A device designed to give the illusion of seeing pictures in three dimensions. Very popular in past generations. Currently, three-dimensional viewers are available for color film in devices produced under brand names such as Viewmaster or Tru-Vue. (Brown)

STEREOSCOPIC FILM Film exposed in matching pairs of frames, with one frame of each pair representing the right-eye view of the scene, and the other frame representing the left-eye view of the scene. A slight but definite difference in angle of view, or parallax between right and left eye versions of the scene provides a realistic depth perception cue when the right-eye positive picture is presented exclusively to the viewer's right eye and the left-eye positive is presented exclusively to the viewer's left eye. (UFPA)

STILL-MOTION SLIDES Through the use of polarized overlays on slides and overhead transparencies and a revolving disk at the projection lens of the projector, various forms of movement can be simulated in a stationary slide. Linear motion, turbulence, radiation, blinking and rotary motion are some of the movements that can be simulated. This technique lends itself to display box animations, flow charts of process, as well as slide and overhead projector presentations. (ANA)

STOP-MOTION PROJECTOR A projector designed with speed controls and a stop-start mechanism so that images can be projected at variable speeds or held immobile. (Kinder)

STORYBOARD A detailed outline or shooting script used in the production of a sequential visual presentation. (D & T Comm)

STRIP FILM See FILMSTRIP

SUPPLY REEL See REEL, SUPPLY

TACHISTOSCOPE A flash meter; a device similar to a shutter of a camera, used to permit momentary exposure of slides or portions of slides for instruction. (Lewis)

TAKE-UP REEL See REEL, TAKE-UP

TELEMATION A complex of existing devices combined into one rather intricate instrument which includes a wall-sized panel of three (or more) translucent screens; a tape recorder, movie projector, three transparency projectors and one opaque projector--all situated behind the screens; an instructor's lectern; and pushbutton control panel for operating the equipment. Can be programed on a punched tape for automatic presentation. (See also TELEPROMPTER.) (D & T Comm)

TELEPROMPTER A mechanical "cue" feeder to television actors (or teachers), has been broadened and developed into one of the effective mechanical aids available to speakers (or lecturers).

Large typed words, eight times the size of regular typewriter type, unroll through a compact unit in front of the speaker. The typed words, on a long roll of paper, enter the speaker's field of vision at a rate of speed controlled by either the speaker or an assistant.

It is possible to go back in the speech or go forward at an accelerated rate if the occasion demands.

Using more than one unit in synchronization, the speaker can apparently look the audience in the eye as his eyes travel back and forth from the multiple teleprompters placed to the left and right of the lectern.

By incorporating a set of solenoid switches in one of the teleprompters and placing thin strip of adhesive-backed aluminum foil on the roll of teleprompter paper at the cue words, to activate the switches, recorders, projectors, and room lights can be turned off and on in synchronization with the speaker's delivery. (See also TELEMATION) (ANA)

TELOP An opaque projector arranged to project images picked up by reflecting light from the surface of opaque graphics, such as pictures, drawings, typed material. It is not necessary to employ slides or other transparencies with unit. A part of a multiplexer arrangement, the "Telop" feeds projected images to the television camera. (Lewis)

THERMOPLASTIC RECORDING A process which combines the processing speed and versatility of magnetic recording and the storage capacity of photography; it can concentrate 100 times as much information in a given space as can magnetic recording. It records almost instantaneously and will produce pictures in color or black-and-white, but does not require chemical processing and can be erased and reused as desired. Presently under experimental development by General Electric. (D & T Comm)

THREAD To place film or tape correctly in the prescribed path of a projector or tape recorder. (D & T Comm)

THROW Distance from a projector to the projection screen. (D & T Comm)

THUMB MARK An identification point drawn on or marking device pasted onto the upper left or right-hand corner of slides to insure consistent, proper insertion in the projector. (D & T Comm)

TRANSLUCENT Semi-transparent, not clear, but capable of transmitting diffused light. (NABDC)

TRANSPARENCY Transparent materials designed for projection in order to facilitate enlargement of the image; originally associated with 2" × 2" and 3¼" × 4" slides, the term is now more popularly associated with 7" × 7" and 10" × 10" slides used with overhead projectors. (See also OVERHEAD PROJECTOR AND OVERLAY.) (D & T Comm)

TRANSPARENT Capable of transmitting rays of light through its substance. (D & T Comm)

TREATMENT A brief written outline of a proposed cinematic (or other) rendition of a story. (UFPA)

ULTRAVIOLET The section extending beyond the violet end of the visible spectrum, the rays of which exert a high degree of photochemical action. (D & T Comm)

VARIABLE AREA TRACK Any sound track recorded in the form of a modified photo-oscillographic trace more or less sharply divided longitudinally into two components, one essentially opaque, the other essentially transparent. (UFPA)

VARIABLE DENSITY TRACK Any sound track in which a recorded sound is represented as full track width density variations extending along the length of the track. In variable density tracks the density range from a local maximal density to an adjacent minimal density is related to amplitude, while the spacing between adjacent local maximal (or minimal) densities is related to frequency. (UFPA)

VIDEOGRAPH A system of quickly reproducing opaque, permanent copies of images appearing on a special television tube. (Lewis)

VIEWER Term most frequently employed for the table-mounted or hand-held device used by one person or a group of persons to see a filmstrip, slides, overhead transparencies, or a motion picture. Useful in previewing or editing such visual material. (D & T Comm)

VISUAL MATERIALS Those instructional materials which communicate primarily through sight. Written and printed material as well as projected pictures, charts, maps, objects, specimens, and the like are visual materials. (Cross)

VU-GRAPH See OVERHEAD PROJECTOR

WET MOUNT The process of mounting a flat picture on a heavy cardboard backing with an adhesive cement such as rubber cement; the term for the finished mounted picture or illustration itself. (D & T Comm)

XEROGRAPHY A process of duplication in which an image is printed on paper through a series of electrical charges. (D & T Comm)

3. PHOTOGRAPHY AND CINEMATOGRAPHY

A-B ROLLS Rolls of original film, or other film used to reproduce prints of the completed motion picture, that are prepared for printing in synchronized form and designated "A roll," "B roll," "C roll," and so on. A-B roll editing permits the printing of all scenes on the finished prints without evidence of splices. (Gordon)

ABERRATION Color or image distortion in a lens or optical system. (Lewis)

ACADEMY LEADER The leader specified by the Academy of Motion Picture Arts and Sciences as standard for motion picture prints for distribution in theaters and television stations, commonly placed on 35mm and 16mm film by request. Adherence to the recommended use of the leader permits smooth, unnoticeable change-overs from one reel to another during the running of the film. (Gordon)

ACETATE FILM Shortened term for cellulose acetate, the chemical base used in safety film. Practically all 8mm and 16mm film is acetate, as is the 35mm film used in 2" × 2" slides and filmstrips. (Kinder)

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AMBIENT LIGHT Illumination from sources that may interfere with planned lighting. Ambient light falling on a TV receiver screen may show up as distracting "hot spots." (Lewis)

ANAMORPHIC LENS A lens designed to distort an image in a systematic way, usually by means of an element or elements having cylindrical rather than the usual spherical surfaces. Such a lens usually is designed to compress the image along one axis of the focal plane, leaving the image unaffected in the focal plane direction at 90° from that axis. The object usually is to obtain a wide-screen image by projecting such a picture through a correcting lens having the same characteristics as the lens used on the camera. (UFPA)

ANGLE SHOT A shot continuing the action of a preceding shot, but from a different camera angle. (See also SHOT.) (UFPA)

ANIMATION The art or process of synthesizing apparent mobility of inanimate objects or drawings through the medium of cinematography. This is usually achieved by exposing film in a motion picture camera to such materials in units of one, two or three frames (single-, double-, and triple-frame animation) before movement of the materials or images to the position to follow. (UFPA)

ANSWER PRINT The first combined picture and sound print, in release form, of a finished film. It is usually studied carefully to determine whether further changes are required prior to release printing. (UFPA)

APERTURE An opening in the lens system of a camera through which light passes from the scene through the lens to the film. In a projector, light passes through the aperture to the film and thence, to the screen. This aperture also "frames" the film image. In a camera, the aperture may be adjusted by means of an iris to vary the size of the lens opening, thus affecting the amount of light which strikes the film (assuming the same exposure time). (Brown)

APERTURE GATE The part of a motion picture projector consisting of the aperture plate, which determines the exact framing of the image on the screen, and the aperture shoe, a pressure shoe that holds the film snugly against the aperture plate during projection; not to be confused with "camera gate," the motion picture framing device. (Gordon)

BACK LIGHT See LIGHTING

BARN DOORS Hinged metal plates attached to certain lighting sources. The manipulation of these plates permits better control of the light falling on the set. (Lewis)

BASE LIGHT The major or over-all lighting source adjusted to give as near a shadowless effect as possible and at such a light level as to permit effective image pickup. Supplementary light sources may be added for technical effects. (See also LIGHTING.) (Lewis)

BLIMP A soundproofing device that fits over the camera to prevent camera noise from reaching the microphone. Some blimps are integral with the camera, while others are containers capable of housing more than one type of camera. (Gordon)

BLOWUP To enlarge a photograph or negative. (D & T Comm)

BLUE-LINE PRINT (1) A positive print with a blue image usually produced by the diazotype process; (2) Also used to designate a blueprint with blue lines on a white field, made by printing from a negative master. (NABDC)

BLUEPRINT PROCESS Reproduction method using light-sensitive iron salts, which produces a negative blue image from a positive master. (NABDC)

BOOM (CAMERA) A sturdy vehicular support providing vertical, horizontal pivotal, and translational movement for camera and operator, enabling them to assume, rapidly and conveniently, almost any desired angle in relation to the scene to be photographed. (UFPA)

CANDLE POWER The illuminating intensity of a single standard candle; a foot-candle is equal to the light from a one-candle-power source at a distance of one foot. (Lewis)

CHECKERBOARD A technique of splicing A-B Rolls in order to eliminate the image of the film splice from the duplicates. The physically overlapped portion of the film is covered to the frame line in all cases by black leader, thus effectively preventing transfer of the splice image. (UFPA) T-134

CINCH MARKS Scratches on film caused by the presence of dust or other abrasive particles between successive coils results in a scratch mark on either or both sides of the film. Longitudinal cinch marks may result if the center of a roll of film is rigidly held while the outside end is pulled tight. (UFPA)

CINEMATOGRAPHER A motion picture director of photography, cameraman, or assistant cameraman. (UFPA)

CINEMATOGRAPHY Motion picture photography; the creation of the illusion of motion through motion picture techniques. Loosely, the entire complex of activities involved in the staging, direction, photography, editing, and presentation of motion pictures. (UFPA)

COLOR (1) Photography in natural color, as compared with photography in black and white; (2) The psychological sensation arising as a result of ocular perception of, and discrimination between, various wave lengths of light; (3) Any feature incorporated in a scene for the sake of its contribution to the authenticity of the scene. (UFPA)

COMPOSITE PRINT A positive motion picture print containing both the picture and the sound. (Gordon)

COMPOSITION In photography and art, composition refers to the planned arrangement of items or objects which make up the picture. (Kinder)

CONDENSING LENS A lens which serves to gather the light rays from a source and to condense or concentrate them. (Kinder)

CONTINUITY As used in connection with scripts for radio, television or film production. A specific outline of the sequence of events to be presented. (Brown)

CONTRAST (1) Lighting Contrast: the ratio between the maximum and minimum intensities of incident light on the subject, or radiated and/or reflected light from the subject; (2) Photographic Contrast: in terms of negative or positive film, the ratio between the optically most dense and least dense areas, expressed in terms of gamma--the tangent of the angle formed by the straight-line portion of the D log E curve and the log E axis; (3) Subject Contrast: the scale of tonal values exhibited by a subject. If the scale is short, with little range of tone, it is called "flat," whether generally dark or generally light. If the subject tonal scale is reasonably long, with good gradation from black to white, it is regarded as normal. When the subject tonal range is great, and intermediate tones are relatively lacking, the subject is termed "contrasty." (UFPA)

CRADLE MOUNT A carefully balanced attachment for the base of a television, motion picture, or still camera that permits tilt-down. It is fastened to the top of the tripod or pedestal. (D & T Comm)

CRAWL A long sheet of paper installed on rollers and containing a series of titles or credits relating to a television program. When placed in an opaque projector (Telop) connected to a film chain, each line appears in sequence as the roller is turned. (Lewis)

CROPPING To trim or cut off parts of the picture, to eliminate superfluous portions and thus improve composition. (D & T Comm)

CU (CLOSE-UP) See SHOT

CUTAWAY A scene photographed at the site of principal action, interupting the flow of action but containing only a part of the view visible in other scenes. The film editor uses the cutaway to bridge two scenes that do not move smoothly from one to the other. (Gordon)

DARKROOM A room for photographic purposes which is light-proof and which is equipped with special safety lights--usually red, green or orange. (D & T Comm)

DEFINITION Appearance of sharpness or of being in focus of an image. (Lewis)

DENSITY Defined as the logarithm of the opacity. In general terms, the relative darkness of an image area. (NABDC)

DEPTH OF FIELD Assuming an imaginary line extending from the camera-film plane to the scene of action, the distance along this line from the closest point visible in acceptable focus to the farthest point visible in sharp focus is said to be the depth of field. (Gordon)

DIAZO Light-sensitive component of diazotype materials which reacts with couplers to form axo dyes. (NABDC)

DOCUMENTARY The term to describe the type of motion picture or television program that purports to show reality and in which techniques are secondary to the theme. (Gordon)

DOLLY A platform or frame equipped with wheels or casters on which the tripod or pedestal supporting cameras or other equipment is mounted. (D & T Comm)

DUPLICATING Creating an exact (or nearly exact) copy of a recording, a drawing, a printed page, etc. (Cross)

EDITING The process of assembling, arranging, and trimming film, both picture and sound, to the best advantage for the purpose at hand. Same as "cutting." (UFPA)

EMULSION The coating, consisting of gelatin and silver salts (unprocessed film) or gelatin and metallic silver (processed film) bonded to and supported by the film base. (UFPA)

ENLARGEMENT A print made from a smaller negative through a projection process. (D & T Comm)

EXPOSURE Exposure is the process of subjecting a photographic film to any given intensity of light in such a manner that it may produce a latent image on the emulsion. (UFPA)

EXPOSURE METER Any of several types of optical or photoelectric equipment designed to assess reflected or incident light quantitatively. Most are equipped with an adjustable computer into which the several pertinent values can be inserted, and from which the exposure required for a specific scene can be read. (UFPA)

EYE LIGHT A special source of illumination designed to effect desirable reflection from the eyes and teeth of a subject without substantially affecting the over-all lighting condition. (See also LIGHTING.) (Lewis)

f-VALUE A system of rating lenses which states the relationship that exists between the lens opening and its focal length. It indicates the intensity of the light which strikes the film in the camera, and is written f/ = F/d, in which F is focal length and d is diameter of lens. (Kinder)

FACSIMILE An electronic system for transmitting pictures and graphic materials over very high frequency air waves. (Kinder)

FILL LIGHTING See LIGHTING

FILM, NEGATIVE In photography, film which is used to receive the image photographed. In a negative, the image is in reverse from its normal appearance: dark subject areas are light or clear in the negative, and light subject areas are dark. The negative is later printed on positive film or paper. (Brown)

FILM, PANCHROMATIC Film that is sensitive to all colors of the visible spectrum. (Brown)

FILM, POSITIVE Film upon which images are reproduced for projection, and in which all their elements are presented in normal tonal relationships, as observed by the eye. (Brown)

FILM, REVERSAL A film, used in photography, which serves as both negative and positive. When the film is processed the negative image is reversed to become a normal positive image for projection. (Brown)

FILM, SILENT A motion picture film on which no sound track has been recorded. Generally, silent film is 16mm and has sprocket holes on both edges. "Silent speed" for projection of 16mm is 16 frames per second. (Brown) T-138

FILM, SOUND A motion picture film with self-contained sound track (optical or magnetic). A 16mm sound film has sprocket holes on one edge only. Projects properly at 24 frames per second. (Brown)

FILM, TRAINING A film produced with an instructional objective; may be synonymous with "educational" or "instructional" film. Sometimes conceived to be a film solely for instruction in skills. A military term for instructional films. (Brown)

FILMOGRAPH A "motion" picture made by photographing motionless subjects with a motion picture camera. (Kinder)

FIXED FOCUS Of a lens, adjusted in manufacture to exhibit maximum depth of field, and permanently positioned relative to the film plane. Used chiefly on inexpensive amateur cameras. (UFPA)

FLUTTER Undesirable movement, in the recording of picture or sound, which results in deterioration of the fidelity of the picture or sound record. In the case of pictures, this can occur during exposure of the film in the camera, during the printing process as the image is transferred from one piece of film to another, or in the projector while a print is shown on the screen. Flutter in sound may be variable, or it may be aperiodic, depending on its origin, which is usually the erratic or aperiodic irregularity of motion of some mechanical component involved in recording or reproducing the sound. (See also WOW.) (UFPA)

FOCAL LENGTH For any thick lens, or combination of lens elements such as a photographic objective, the focal length is the distance from either principal focus to the corresponding principal point. The "principal points" are two positions on the optical axis, separated from each other by a distance variable with the characteristics of the individual lens or combination of lenses, and under ordinary conditions they coincide with the conjugate points for unit magnification, in this context being known as "nodal points." (UFPA)

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FOCUS The maximum definition of image attainable with a lens through adjustment of its optical relationship to the plane in which the image is formed. (UFPA)

FOIL Term used to refer to the sensitive plastic sheets used in ammonia-type printing. (Kinder)

FOOT CANDLE The illumination falling on a spherical surface one foot distant from a point light source of one standard candle intensity. Also expressed as the illumination on a surface one foot square when the uniformly distributed luminous flux has a value of one lumen. (UFPA)

FOOTAGE In the United States and some other countries, length of motion picture film is usually expressed in the English system, with the foot as the basic unit. Width, or gauge, of film, however, is universally expressed in the metric system. (UFPA)

FRAME An individual picture in a series of pictures, as in a motion picture film or filmstrip. (D & T Comm)

FRESNEL A special lens with concentric circle forms impressed in its front surface to focus spotlight beams for use in studio lighting. May be obtained in a variety of designs with restricted focusing from a 16° beam to a flood beam of 70°. (Lewis)

GATE, FILM A mechanism covering the film channel of a motion picture or filmstrip projector. The gate may be opened to insert or remove the film from the projector or to clean the film channel, guides, pressure plate, and aperture. (Brown)

GLOSSY Applied to photographic papers that are specially coated to receive a high luster when dried. (D & T Comm)

GRAININESS In photography, a defect characterized by poor uniformity of color distribution, more or less in the pattern of small dots or grains, amplified by enlargement. (D & T Comm)

GRAY SCALE (1) A strip of paper or film which has a graduated series of tones from white to black. (D & T Comm) (2) Variations in value from white, through shades of gray, to black on a television screen. The gradations approximate the tonal values of the original image picked up by the TV camera. Some systems are capable of producing a relatively high number of gradations in the gray scale, whereas others may be rather limited. (Lewis)

HALF-TONE Method of simulating continuous tone by breaking an image into dots of equal density but variable area. (NABDC)

HUE That quality of a color related to the wave length of light which the color reflects. (NABDC)

ICONOGRAPHIC Term given to recent developments in the filmographic technique in which illusions of motion are created by camera, narrative, and music. (Kinder)

IMAGE REPRODUCTION The controlled visual re-creation or duplication of an animate or inanimate process or material through a chemical, ultraviolet, mechanical, graphic, photographic, electronic scanning, or other process; e.g., an overhead transparency, photograph, printed page, motion picture, radio facsimile, or television transmission. (D & T Comm)

IRIS An adjustable diaphragm, usually incorporated in the structure of a lens barrel, designed to control the amount of light passing through a lens. Ordinarily made up of a series of interlocking leaves, the iris opening is usually set up to be accurately concentric with the optical axis of the lens, and is calibrated in terms of f-stops or t-stops. (UFPA)

KEY LIGHT See LIGHTING

KINESCOPE The kinescope is the picture tube of a television receiver. However, recently the term has been applied to motion picture films made by photographing the images produced on the "kinescope," or picture tube. (Cross)

LEADER The extremities of a roll or reel of motion-picture film are called "leaders" or "protective leaders." Leader stock also is used in negative cutting to maintain synchronization between succeeding scenes on the A-roll, the B-roll, etc. Stock usually is opaque, either coated or exposed black-and-white film, which may be either dark (exposed to light) or clear. Leader stock is used in developing machines to maintain continuity of the film path through the various baths and dryers. (See also ACADEMY LEADER.) (Gordon)

LENS (1) In optics, any transparent system by which images may be formed through the light-refracting properties of curved surfaces. Photographic objectives usually are made up of a number of individual units, each having a combination of positive and/or negative spherical section surfaces. In some instances the unit combination includes a neutral, or planesurface. The several units are mounted in a specific relationship to each other in a cylindrical mounting, or barrel, which usually also includes an iris diaphragm with it calibrated external scale, and a mechanical device to permit focussing. Glass of appropriate index of refraction is used for each of the unit elements, some combinations of which may be cemented together with an optical cement such as Canada Balsam. Other combinations may be related by an air space, as dictated by the demands of the specific lens design; (2) Commonly any optical system complete with barrel, focussing ring, etc. (UFPA)

LENS, ANAMORPHIC See ANAMORPHIC LENS

LENS, CONDENSING See CONDENSING LENS

LENS SPEED Refers to the ability of a lens to pass light. A fast lens would be rated f/1.4; a much slower lens might be designated as f/8. The larger the f number the slower the lens. (See also f-Value.) (Lewis)

LENS TURRET See TURRET

LIGHT METER A device incorporating a photocell connected to a calibrated meter to read directly in foot candles. Used to check light levels in a scene or set to be televised or photographed. (D & T Comm)

LIGHTING (1) The condition or state of being lighted, or the means or technique of illuminating. In motion picture photography (or TV), the illumination of the action field.

(2) Back Lighting: lighting the subject from the side opposite the camera to provide a limning effect which helps to separate the subject from the background.

(3) Cross Lighting: lighting from an angle approaching perpendicularity with the lens axis. Used for modeling and to emphasize texture. T-142

(4) Fill Lighting: lighting used to illuminate shadow areas resulting from the main, or key light source.

(5) Key Lighting: lighting on the subject received from the main, or dominant light source.

(6) Highlighting: lighting to emphasize the central point of interest of a scene. (See also BASE LIGHT, EYE LIGHT, SPOTLIGHT.) (UFPA)

LIP SYNC The production of a film or kinescope with recorded sound track that is synchronized with the spoken words of the person or persons involved in the film. Films that do not incorporate lip sync might have a narrator's voice recorded on the film. (Lewis)

LOOP In motion picture projection, the word "loop" refers to a slack portion of the film immediately above and below the "gate" area; permits the film to move intermittently without being damaged. (Brown)

LS (LONG SHOT) See SHOT

MAGAZINE A container for film, tape, slides or filmstrips, usually embodying a transport mechanism, designed to supply or present the material for controlled exposure. Most magazines are built to integrate with specific equipment, with drive mechanisms mechanically coupled. (D & T Comm)

MAGNETIC FILM A sprocketed synchronous acetate base with a magnetic coating that is available from stock in 35, 17½, 16, and 8mm sizes. Characteristically, the film resembles the commonly known ¼" tape varieties, but through the use of sprockets it can be synchronized exactly to film. (Gordon)

MAGNETIC SOUND Sound which has been recorded on iron oxide coated film or tape by an electronic magnetic process. (Kinder)

MAGNETIC SOUND PROJECTOR A motion picture projector capable of showing motion picture film which has either an optic or magnetic sound track. (Kinder)

MAGNETIC TAPE An acetate or plastic ribbon coated on one surface with tiny iron oxide particles. The ¼" width tape is ordinarily employed for magnetically recording audio for subsequent reproduction. Special tapes of greater width are used for magnetic storage of data in computers. The most recent development is the 2" width used in video tape recording the entire television program, including the audio, video, and synchronizing and control signals. (Lewis)

MASK In photography, a mask is a frame of cardboard or other substance used to confine the picture area of slides or transparencies, and to give support to the projection material in the slide. (Brown)

MASKING Protecting part of a light-sensitive layer by an opaque shield during part of an exposure. (NABDC)

MATTE FINISH Dull, gloss-free surface finish. (NABDC)

MCU (MEDIUM CLOSE-UP) See SHOT

MICROPHOTOGRAPHY Still or motion picture photography of minute objects through the lens system of a microscope. (D & T Comm)

MIX To combine sound from two or more sources into a single recording (or output), usually with adjustment of tonal quality and/or relative volume level. (UFPA)

MLS (MEDIUM-LONG SHOT) See SHOT

MONTAGE In motion picture editing, the technique of cutting together a number of scenes that are either joined by straight cuts or dissolves to give an over-all impression; also refers to the printing of several scenes together in the same composition by the use of traveling mattes and an optical printer. (Gordon)

NEGATIVE See FILM, NEGATIVE

NITRATE FILM Cellulose nitrate or celluloid film; a highly inflammable plastic used as the base of theatrical motion picture film, and in earlier years, on 16mm educational films. (See also ACETATE FILM) (D & T Comm)

OBJECTIVE LENS The lens or system of lenses which forms the primary image in an optical system. (D & T Comm)

OPACITY The ratio between the amount of light incident upon a transparent surface and the amount of light transmitted by that surface. Opacity is the reciprocal of transmission, and its log is equal to density. (UFPA)

OPAQUE That property of being impervious to light and non-transparent. (NABDC)

OPTICAL SOUND Sound which has been recorded and/or printed on photographic film by exposing and processing the light-sensitive sound track area. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Kinder)

ORTHOCHROMATIC FILM A film sensitive to ultraviolet, blue and green, but not red colors. (Kinder)

PAN See SHOT

PANCHROMATIC FILM See FILM, PANCHROMATIC

PAN-TILT HANDLE An extension rod attached to a camera mount to enable the cameraman to pan or tilt the camera manually. (Lewis)

PANTOGRAPH (LIGHTING) A light-fixture suspension device with provision for raising and lowering the light source; unit extends or contracts in much the same way as an accordion. (Lewis)

PARALLAX The apparent displacement of an object in relation to its background due to observation of the object from more than one point in space. In camera work, the viewfinder often is mounted with its optical axis at an appreciable distance from the optical axis of the camera lens, commonly resulting in inadvertent positional errors in framing, due to parallax. In more elaborate cameras a special mechanical arrangement permits using the viewfinder with its optical axis coincident with that of the camera lens, thus effectively eliminating this error. (UFPA)

PERSISTENCE OF VISION A time-lag effect between visual stimulation of the eye and cessation of response to that stimulation. For any intermittently illuminated source there is a critical frequency (which depends on the brightness of the source) above which the average eye can detect no sensation of flicker. With the average screen illumination used in motion pictures, this critical frequency is approximately sixteen such intermissions per second for the average eye, and rates above this frequency appear to be continuous. (UFPA)

PHOTOCOPYING A process whereby duplicate copies of hand-drawn or printed materials, including pictures, are made by automatic photocopying machines. (Kinder)

PHOTOELECTRIC CELL A small device designed to generate minute electrical currents when exposed to light. In sound motion picture projectors, the cell reacts to the light from the EXCITER LAMP. (Cross)

PHOTOGRAM A picture taken on photographic paper, but without the aid of a camera. (Kinder)

PHOTOMICROGRAPHY Same as MICROPHOTOGRAPHY

PHOTOPLAY A motion picture made from a play or drama, such as "Richard III" or "Helen of Troy." The term has been used loosely to include almost any major or "Class A" motion picture production. (Kinder)

PHOTOSTAT Trade name of a camera which makes copies of documents, letters, drawings, etc., on sensitized paper; also the generic term for copies made by means of this or a similar camera. (See also PHOTOCOPYING.) (D & T Comm)

POSITIVE FILM See FILM, POSITIVE

POSITIVE IMAGE A positive image is a photographic replica in which the value of light and shade of the original photographed subject are represented in the natural order. In the case of color film, the positive image also represents each color of the original photographed subject in the natural order tonal range as it appears in the subject. (UFPA)

PRINT OR POSITIVE These terms are used to designate any of the following: (1) The raw stock specifically designed for positive images; (2) The positive image; (3) Positive raw stock which has been exposed but has not been processed; (4) Film bearing a positive image which has been processed. (UFPA)

PRINTING Making positives from a negative either by contact or by projection. (D & T Comm) T-146

PROJECTION, REAR-SCREEN See REAR-SCREEN PROJECTION

REAR-SCREEN PROJECTION The projector, located behind a translucent screen, is placed in front of the viewers. May be housed in a self-contained unit or in a projection room. A mirror or mirror system adapted to the projector reverses the image from left to right. (Also referred to as "indirect projection" since the mirror system bends the projection beam.) (D & T Comm)

RECORDER, FILM A device for recording sound on film by photographic process. (Brown)

REEL (MOTION PICTURE) The standard unit of film length when referring to a completed production. It is a one-reel or two-reel film. A reel consists of 360 feet of 16mm film or 900 feet of 35mm film, requiring ten minutes of screen time. . . . Release prints are always maintained on reels, whereas stock footage (original and print) is maintained on cores. (Gordon)

REEL, SUPPLY Reel which supplies film or tape as it is being recorded or played back. Also called "feed reel." (D & T Comm)

REEL, TAKE-UP Reel which receives film or tape as it is being recorded or played back. (D & T Comm)

REFLEX CAMERA A single or double lens camera in which the object to be photographed is seen in focus on a ground glass or viewing lens. In single lens style, the same lens is used for viewing and taking; in double lens, a view and focus lens is coupled with a taking lens. (Kinder)

RELEASE PRINT A composite print, including both picture and sound (unless it is a silent film), available for exhibition on standard projection equipment. (Gordon)

REVERSAL FILM See FILM, REVERSAL

REWIND (1) (Verb) Act of returning recording tape or projection film from take-up reel to supply reel after playback or projection; (2) (Noun) Unit, often built into recording or projection equipment, which, when threaded and electronically (or manually) activated, returns material to the supply reel. (D & T Comm)

ROUGH CUT The assembled work print of a motion picture in its first assembly stage. A preparatory step before beginning the "smooth cut." (Gordon)

SCANNING Systematic impingement on all parts of an area by a narrow beam of light, or other electromagnetic radiation, which is either initially modulated (optical sound recording) or which becomes modulated in the scanning process (television, optical sound pickup). (UFPA)

SCOOP A floodlight employed to illuminate large areas at close range. (Lewis)

SCRIPT A set of written specifications for the production of a motion picture, television program, or other rendition of a presentation; includes narration and presentation layout. (D & T Comm)

SHOT (1) A single run of the camera; (2) The piece of film resulting from such a run. Systematically joined together in the process of editing, shots are synthesized first into scenes; the scenes are joined to form sequences, and the sequences in turn are joined to form the film as a whole. The specific meaning of designations for shots varies with the application, but, in general, a "close-up" suggests that the frame area is well filled by the image of the subject, whether the subject is a mountain or a molehill. In a similar way, a "long-shot" suggests that the image of the subject occupies a relatively small portion of the frame area, and that the central subject is in this way visually related to its immediate environment. Thus, the camera-to-subject distance, the focal length of the lens, and the absolute size of the subject influence the arbitrary designation for a specific shot. In view of these variable factors, the exact meaning of the following shot designations should be interpreted in relation to specific applications.

Close-up: Image of subject fills greater part of frame area.

Cut away: Action going on at the same time as, but not part of, the main action. T-148

Cut-in: Usually an extreme closeup of part of the main action.

Dolly: Camera moves translationally in space as shot proceeds.

Establishing: Any shot used to orient the audience in regard to location, time, or circumstances of action.

High Angle: Subject or center of interest lies below camera level.

Insert: Usually a close-up, showing detail necessary for proper understanding of the over-all action of a sequence.

Long: Image of subject relatively small in frame, shows relationship of subject and setting.

Low Angle: Subject or center of interest lies above camera level.

Medium: About half-way between a long shot and close-up to simulate normal viewing distance.

Medium Close: About half-way between a close-up shot and a medium shot.

Medium Long: About half-way between a long shot and a medium shot.

Over the Shoulder: Of one person from behind or near the shoulder of another person.

Pan: Camera moves in azimuth as shot proceeds.

Re-establishing: Usually a long shot, from a new angle, in the middle or at the end of a sequence.

Reverse Angle: Angle changes nearly 180 degrees.

Running: Camera moves to pace movement of subject as shot proceeds.

Wild: Any shot made without matching synchronous recording.

Zoom: Apparent motion of camera toward subject as shot progresses. Achieved either through rapid motion of camera, or with zoom lens. (See also ANGLE SHOT, TRUCKING.) (UFPA)

SHUTTER In a motion picture camera, the mechanical device which shields the film from light at the aperture during the film movement portion of the intermittent cycle. Also, a similar device in projectors for cutting the projection light during the time the film is moving at the aperture. (UFPA)

SOUND DRUM The portion of the mechanism of a sound motion picture projector around which the film passes at the point where the sound is picked up. The sound drum is usually attached to a flywheel to stabilize the movement of the film through the projector at this point. (Brown)

SOUND TRACK The portion of the motion picture film on which the sound is recorded, normally one band in 16mm along the edge opposite the sprocket holes. It may be optical or magnetic, or both, and with stereo sound may have two or more tracks. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Gordon)

SPEED, SILENT See FILM, SILENT

SPEED, SOUND See FILM, SOUND

SPLICE Joining two pieces of motion picture film or recording tape. Film splicing is accomplished by welding the film ends together in a special machine, and with special cement, to ensure accurate joining. A special splicing tape is used to join pieces of recording tape. (Brown)

SPONSORED FILM Any film whose production costs have been borne by someone or a company for the purpose of exhibiting the film free of admission charges (or rental costs); it is intended to accrue credit or prestige to the sponsor. On occasion, sponsored film are shown in locations where an admission fee is charged. (Gordon)

SPOTLIGHT Lighting fixture offering a concentrated beam of illumination. Models vary from small low-wattage units to large 5,000 watt arrangements. (See also LIGHTING.) (Lewis)

SPROCKET HOLES Holes along the edge of film that engage teeth in sprocket wheels. Sprocket wheels turn to advance film through the projector (or camera). (Brown)

STEREO-CAMERA A camera with two lenses which takes two pictures simultaneously. When the finished pictures are properly mounted, the viewer gets a three-dimensional image. (Kinder)

STEREOSCOPIC FILM Film exposed in matching pairs of frames, with one frame of each pair representing the right-eye view of the scene, and the other frame representing the left-eye view of the scene. A slight but definite difference in angle of view, or parallax between right and left eye versions of the scene provides a realistic depth perception cue when the right-eye positive picture is presented exclusively to the viewer's right eye and the left-eye positive is presented exclusively to the viewer's left eye. (UFPA)

STOP The relationship between the focal length of a lens and the effective diameter of its aperture. An adjustable iris diaphragm permits any ordinary photographic lens to be used at any stop within its range. The numerical series 1.0, 1.4, 2.0, 2.8, 4.0, 5.6, 8, 11, 16, 32, 45, 64 constitutes a range of "full stops" in that closing the diaphragm from any one of these f-numbers reduces exposure by one-half; or, opening the diaphragm from any number doubles the exposure. (See also f-VALUE and T-STOP.) (UFPA)

STOP-MOTION PROJECTOR A projector designed with speed controls and a stop-start mechanism so that images can be projected at variable speeds or held immobile. (Kinder)

STORYBOARD A detailed outline or shooting script used in the production of a sequential visual presentation. (D & T Comm)

SUPPLY REEL See REEL, SUPPLY

SYNCHRONIZED In motion picture projection, refers to the proper relationship between the sound and the picture on the screen. If lip movement and speech do not occur in proper relationship, the picture and sound are "out of synch." (Brown)

SYNCHRONIZED MOTION PICTURE PROJECTOR A motion picture projector that is specially equipped with a speed and shutter mechanism that is compatible with the television frame and scanning system. The use of nonsynchronous projectors ordinarily results in interference patterns on the reproduced images. (Lewis)

T-STOP A system of calibration for rating the speed of lenses. This direct system is based on actual light transmission and is beginning to be recognized as more realistic than the older f/stop system. (See also f-VALUE and STOP.) (Lewis)

TAKE-UP REEL See REEL, TAKE-UP

TELESCOPIC PHOTOGRAPHY A photographic technique of taking pictures of objects too distant for the ordinary camera lenses; hence the use of a telephoto lens. (Kinder)

THERMOPLASTIC RECORDING A process which combines the processing speed and versatility of magnetic recording and the storage capacity of photography; it can concentrate 100 times as much information in a given space as can magnetic recording. It records almost instantaneously and will produce pictures in color or black-and-white, but does not require chemical processing and can be erased and reused as desired. Presently under experimental development by General Electric. (D & T Comm)

THREAD To place film or tape correctly in the prescribed path of a projector or tape recorder. (D & T Comm)

THROW Distance from a projector to the projection screen. (D & T Comm)

TIME-LAPSE A motion picture technique used for visualizing normally invisibly slow processes. In the original photography a greater than normal time interval elapses between exposures of successive frames. Projection at normal projection speed results in an apparent speed-up of the action. The degree of the speed-up effect achieved depends on the time interval between successive exposures when the original is made. (UFPA)

TRANSLUCENT Semi-transparent, not clear, but capable of transmitting diffused light. (NABDC)

TRANSPARENT Capable of transmitting rays of light through its substance. (D & T Comm)

TREATMENT A brief written outline of a proposed cinematic (or other) rendition of a story. (UFPA)

TRIPOD A three-legged supporting stand. When used to support a camera, the legs are usually adjustable for height, and some means of fastening the camera to the top of the stand is provided. They range from very simple to very complex, depending on the elaborations incorporated in the specific model. (UFPA)

TRUCKING To move a camera translationally in space as a shot proceeds, usually by means of a dolly or other vehicular camera support. The purpose is to pace, and maintain image size of, moving actors or objects. (See also SHOT.) (UFPA)

TURRET A rotary plate mounted on the front of a camera and provided with accommodations for two or more lenses, any of which may be moved rapidly into position for appropriate motion picture or television camera shots. (D & T Comm)

ULTRAVIOLET The section extending beyond the violet end of the visible spectrum, the rays of which exert a high degree of photo-chemical action. (D & T Comm)

VARIABLE AREA TRACK Any sound track recorded in the form of a modified photo-oscillographic trace more or less sharply divided longitudinally into two components, one essentially opaque, the other essentially transparent. (UFPA)

VARIABLE DENSITY TRACK Any sound track in which a recorded sound is represented as full track density variations extending along the length of the track. In variable density tracks the density range from a local maximal density to an adjacent minimal density is related to amplitude, while the spacing between adjacent local maximal (or minimal) densities is related to frequency. (UFPA)

VIEWFINDER (OPTICAL) A camera component arranged to indicate the boundaries of the camera's field of view. External viewfinders may be as simple as an open wire loop used with a properly spaced pupil for viewing, or it may be an elaborate optical device with provision for altering the boundaries of its field to correspond with the field of any of several camera lenses. External viewfinders, to be accurate, must be corrected for parallax. This possible error in framing is obviated in the case of a type of integral viewfinder which can be moved into position for viewing the field through the camera lens. (See also PARALLAX and REFLEX CAMERA.) (UFPA)

VISION PERSISTENCE OF See PERSISTENCE OF VISION

WIDE-ANGLE LENS Any lens of relatively short focal length. In 16mm camera work, any lens of less than 25mm, focal length. (UFPA)

WORKPRINT Any picture or sound track print, usually a positive intended for use in the editing process to establish through a series of trial cuttings the finished version of a film. The purpose is to preserve the original intact (and undamaged) until the cutting points have been established. (UFPA)

XEROGRAPHY A process of duplication in which an image is printed on paper through a series of electrical charges. (D & T Comm)

ZOOM LENS A variable-focal-length lens that permits the change of focal length while the picture is being photographed, thus giving the impression of moving in and out of the scene. A shot using the zoom lens in this fashion is called a "zoom shot." (See also SHOT.) (Gordon)

4. AUDIO REPRODUCTION

A.C. See ALTERNATING CURRENT

ACOUSTICS The science concerned with the attributes of sound. Also, loosely, the sound characteristics of an enclosure, such as a room. (UFPA)

ALIGNMENT, HEAD Adjusting the record-playback head so that the angle of its gap is exactly perpendicular to the tape as it moves past. Misalignment of the head azimuth or head-gap angle results in poor sound. (USOE)

ALTERNATING CURRENT Electric current which alternates direction rather than following continuously in one direction. (See also DIRECT CURRENT.) (D & T Comm)

AMMETER An instrument for measuring the amount of electricity flowing through a wire. (D & T Comm)

AMPERE The unitfof measuring the flow of electrical current. (D & T Comm)

AMPLIFIER, POWER Amplifier designed to boost signal energy sufficiently to operate a loudspeaker. (See also PREAMPLIFIER.) (USOE)

AUDIO Of or pertaining to sound. Specifically, a sound recording. Loosely, any part or all of the complex of sound equipment, facilities and personnel. (UFPA)

AUDITION Implies listening, and usually is used to identify the experience of appraising an audio material or oral performance for instructional value and quality.

AUTOMATIC SHUTOFF Special switch on some tape recorders which automatically stops the machine when the tape runs out or breaks. Also called "automatic cutoff." (USOE)

BALANCE Relation between high and low frequency tones of a recording. Also the relation between the levels of two audio signals. (USOE)

BIAS High frequency current fed into the recording circuit to eliminate distortion during the recording process. Also performs function of erasing tape just before it passes the recording head. (USOE)

BINAURAL Of both ears functioning together. (D & T Comm)

BOOM (MICROPHONE) A support, the more elaborate ones vehicular, incorporating a telescoping pole arrangement for suspending and manipulating a microphone in order to obtain its optimum orientation and position outside the camera's field of view. (UFPA)

BRAKING MECHANISM Apparatus on a tape recorder which stops the motion of the reels. If not properly adjusted, tape spillage, stretch, or breakage may occur. (USOE)

BULK ERASER See ERASER, BULK

CABLE A series of conductors insulated from each other and arranged in a variety of patterns to perform transmission, control, audio, and power supply functions in an electrical system. Coaxial cable is designed to pass a wide range of frequencies and is particularly adapted to video and RF transmission applications. (See COAXIAL CABLE for further clarification.) (Lewis)

CAPSTAN Rotating spindle or shaft which draws the tape across the heads (of a tape recorder) at a constant rate of speed on both recording and playback. Operates in conjunction with a rubber pressure roller. (USOE)

CENTRAL SOUND SYSTEM An intercommunication system used in schools, or other large institutions, which permits messages, music, or programs to be transmitted to rooms throughout a building or group of buildings. Provides communication for administrative or instructional purposes. (Brown)

CHANNEL, DUAL (TAPE RECORDER) Usually a stereophonic (dual-track) recorder adapted so that two separate channels (program signal and student signal in an electronic learning laboratory) are recorded simultaneously or sequentially on two separate tracks of the same tape. Special switches and circuitry allow the student channel to be rerecorded without erasing the program channel. (USOE)

CHANNEL, MULTI (TAPE RECORDER) When applied to program source, this means that several sources can be transmitted simultaneously to selected, student positions in the language (or learning) laboratory network. When referring to a recorder, it means that several different signals or channels are recorded or played back simultaneously but separately through a multitrack recorder. (USOE)

CLEAN When applied to sound, this means undistorted and noise-free reproduction. (USOE)

CONDUIT A kind of rigid or flexible metal pipe or tubing which contains the wires that conduct the signals or current. (USOE)

CONVERTER, VOLTAGE An electronic device used in altering voltage supplied to any device. (D & T Comm)

COUNTER, INDEX Similar to an odometer (mileage indicator in automobiles) which indicated the relative amount of tape that has run past the heads. Also called digital counter. (USOE)

CYCLES PER SECOND (CPS) Unit used to measure frequency, or "pitch" of any sound. (USOE)

D.C. See DIRECT CURRENT

DECIBEL A unit used for comparative evaluation of sound loudness in terms of the ration of the amounts of power involved. The ear being responsive arithmetically, as sound power increases or decreases logarithmically, a change of one decibel in sound power level is just perceptible by the ear as a change in sound loudness. (UFPA)

DEMAGNETIZER, HEAD See HEAD DEMAGNETIZER

DIRECT CURRENT That is, electric current which flows in one direction. (D & T Comm)

DISTORTION Improper reproduction of the original sound due to any change that takes place as the signal travels through the electronic system. Distortion of sound reduces its clarity. (USOE)

DUAL-TRACK HEAD See HEAD, DUAL TRACK

DUAL TRACK RECORDER A tape recorder which records two tracks on one tape. Each track covers half the track width. (Kinder)

DUAL-TRACK TAPE See TAPE, DUAL-TRACK

DUBBING A copy of a tape recording made by recording on one machine what another machine is playing. Sometimes called a duplicate or "dupe." (Brown)

DUPLICATING Creating an exact (or nearly exact) copy of a recording, a drawing, a printed page, etc. (Cross)

DYNAMIC RANGE Ratio between the softest and loudest sounds a recorder can reproduce without undesirable distortion. Usually measured in db's. (USOE)

EARPHONES See HEADPHONES

EDITING The process of assembling, arranging, and trimming film, both picture and sound, to the best advantage for the purpose at hand. Same as "cutting." (UFPA)

ELECTROMAGNET Device which becomes magnetized when connected to electric current. (For example, the tape recorder head is an electromagnet energized by the current passing through an amplifier from the microphone.) (USOE)

ERASE In data processing, to destroy the information stored on the surface of a magnetic tape, magnetic drum, or cathode ray tube in order to make this storage space available for new information. (IBM)

ERASE HEAD See HEAD, ERASE

ERASER, BULK Device for erasing an entire reel of tape in a few seconds. It contains a powerful electromagnet which neutralizes the magnetic patterns on the tape. (USOE)

EXCITER LAMP An incandescent lamp used to supply luminous energy to a photoresponsive cell, such as the photocell in a motion picture projector. Interposition of a variable mask or matte, such as a sound track, in the optical path between the exciter lamp and the photocell than results in corresponding variations in the electrical response of the photocell. (UFPA)

FAST FORWARD Tape movement control which permits fast winding of the tape to facilitate location of a specific portion which has not yet been played. The speed of this movement may vary considerably from one model recorder to another. (USOE)

FEEDBACK (ELECTRICAL) Cumulative interaction between microphone and loudspeaker in the same audio circuit. Also, an electrical circuit arranged so that part of the power output is returned to the circuit at a lower level of amplification in order to improve the over-all performance of the amplifier. (UFPA)

FIDELITY Degree of the exactness or faithfulness with which any sound is duplicated or reproduced as compared to the original sound. (USOE)

FLAT RESPONSE Ability of an audio system to reproduce all tones (low and high) in their proper proportion. A sound system might be specified as having an essentially flat response, plus or minus two decibels from 75 to 9,000 cycles per second. (USOE)

FLUTTER Undesirable movement, in the recording of picture or sound, which results in deterioration of the fidelity of the picture or sound record. In the case of pictures, this can occur during exposure of the film in the camera, during the printing process as the image is transferred from one piece of film to another, or in the projector while a print is shown on the screen. Flutter in sound may be variable, or it may be aperiodic, depending on its origin, which is usually the erratic or aperiodic irregularity of motion of some mechanical component involved in recording or reproducing the sound. (See also WOW.) (UFPA)

FREQUENCY Pitch of a sound as determined by the number of cycles per second. (USOE)

FREQUENCY RANGE Range between the highest and lowest pitched sounds which a recorder or sound system can reproduce at a usable output, or volume level. (See also FREQUENCY RESPONSE.) (USOE)

FREQUENCY RESPONSE This is the output level of a recorder or sound system over a specific range of frequencies which is usually charted in the form of a curve. It is more specific than FREQUENCY RANGE and includes the plus or minus decibel rating which shows the "flatness." (USOE)

FULL-TRACK HEAD See HEAD, FULL-TRACK

FULL-TRACK TAPE See TAPE, FULL-TRACK

GAIN Ratio between input and output levels of sound equipment. Gain is increased by means of an amplifier. (USOE)

GAP Minute distance between the poles of a recording head. The shorter the gap, the higher the frequency range of the recorder can be at a given tape speed. (USOE)

HEAD Small ring-shaped electromagnet across which the tape moves (in a tape recorder). This provides the energy which magnetizes the iron oxide coating on the tape into special patterns. (USOE)

HEAD ALIGNMENT See ALIGHMENT, HEAD

HEAD DEMAGNETIZER Hand-held electromagnet used to neutralize the unwanted residual magnetism built up and retained in recording heads. (USOE)

HEAD, DUAL-TRACK Head having two separate pole pieces each, each covering about half the width of the tape so that recording or playback of one or both channels (separately or concurrently) is accomplished with the tape moving in a single direction. Can be used for single-channel, dual-channel, or stereophonic recording. Also called two-track, twin-track, or double-track. (USOE) T-159

HEAD, ERASE Electromagnet which erases or rearranges any magnetic pattern on the tape before a new recording is made. (USOE)

HEAD, FULL-TRACK Head with a gap covering almost the entire width of the tape. Also a single-channel recorder. (USOE)

HEAD, HALF-TRACK Head which records and plays back about one-half of the width of the tape. It can be reversed to obtain use of the second half. This type is used for single-channel recorders. (USOE)

HEAD, PLAYBACK Electromagnet which converts the signal on the recorded tape into electrical impulses which are then amplified and reproduced as sound by a loudspeaker or headphones. (USOE)

HEAD, QUARTER-TRACK Head having two pole pieces which cover the first and third quarters of the tape. The second and fourth quarters are recorded by turning the tape over. Many stereophonic recorders now use this type. (USOE)

HEAD, RECORDING Electromagnet which converts the amplified audio information from the microphone into a succession of magnetic fields that rearrange the magnetic patterns of the iron oxide particles on the tape as it passes the gap. The same head is often used for playback. (USOE)

HEADPHONE (Also called "headset") A device consisting of one or two telephone receivers connected to a headband for individual listening to audio sources, such as intercommunication circuits. Some headsets or headphones are equipped with a small microphone to permit two-way communication. (Lewis)

HI-FI Common designation for "high fidelity"; refers to an instrument capable of reproducing both high and low sound frequencies. (Kinder)

HISS In a tape recorder, a noise which may originate in the amplifier or from the tape itself. Hiss will increase if heads are not demagnetized at intervals and will be recorded on the tape even during playback. (USOE) T-160

HUM Low-pitch background noise caused by poor shielding or mismatching of impedances. It may be "60-cycle hum" picked up from alternating current electrical power wires. Three-pronged polarized plugs may also help prevent this. (USOE)

IMPEDANCE Resistance in a circuit or component to the flow of alternating current which is rated in ohms. Output and input impedances of two or more connecting components must be matched quantitatively. Impedance is usually called "high" or "low." (USOE)

INCHES PER SECOND (I.P.S.) Tape speed is measured in inches per second--$1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$, 15, etc. (D & T Comm)

INDEX COUNTER See COUNTER, INDEX

INPUT (ELECTRICAL) Connecting device, such as a jack, which carries the incoming signal. Also the incoming signal itself. (USOE)

I.P.S. See INCHES PER SECOND

JACK Receptacle for a plug connector which leads to the input or output circuit of a tape recorder or other audio device. Standard phone plugs and jacks are used in most language laboratory systems. Special jack boxes afford several outlets so that several headphones may be plugged in together. (USOE)

KILOCYCLE A measurement unit equal to 1,000 cycles per second and used to express the frequency of radio and other electromagnetic waves. (Lewis)

LEVEL INDICATOR Device on the tape recorder to indicate the relative level at which the recording is being made, and to serve as a warning against under-recording or over-recording. It may be a neon bulb, a magic eye, or a VU meter. (USOE)

LONG PLAYING Usually abbreviated LP; a term applied to records with close or fine microgrooves. These records usually play at 33⅓ or 45 r.p.m. instead of 78 r.p.m. (Kinder)

MAGAZINE A container for film, tape, slides or filmstrips, usually embodying a transport mechanism, designed to supply or present the material for controlled exposure. Most magazines are built to integrate with specific equipment, with drive mechanisms mechanically coupled. (D & T Comm)

MAGNETIC FILM A sprocketed synchronous acetate base with a magnetic coating that is available from stock in 35, 17½, 16, and 8mm sizes. Characteristically, the film resembles the commonly known ¼" tape varieties, but through the use of sprockets it can be synchronized exactly to film. (Gordon)

MAGNETIC SOUND Sound which has been recorded on iron oxide coated film or tape by an electronic magnetic process. (Kinder)

MAGNETIC SOUND PROJECTOR A motion picture projector capable of showing motion picture film which has either an optic or magnetic sound track. (Kinder)

MAGNETIC TAPE An acetate or plastic ribbon coated on one surface with tiny iron oxide particles. The ¼" width tape is ordinarily employed for magnetically recording audio for subsequent reproduction. Special tapes of greater width are used for magnetic storage of data in computers. The most recent development is the 2" width used in video tape recording the entire television program, including the audio, video, and synchronizing and control signals. (Lewis)

MASTER Term used to designate a device which has control over several others or produces the original taped material. Often applied to tape, program, console, switch, duplicator, etc. The term "slave" is used sometimes to designate another device controlled by a "master." (USOE)

MASTER TAPE The tape recording from which duplicates are made. Frequently valuable "master tapes" are copied on metal disc records to insure the recorded material against loss due to fire or accidental exposure of the master tape to strong magnetic fields. (Cross)

MEGACYCLE A unit equal to 1,000,000 cycles per second; used to express the frequency of radio, television, and other electromagnetic waves. One megacycle is equal to 1,000 kilocycles. T-162
(Lewis)

MICROGROOVE Literally means "fine grooving." On the standard 78 r.p.m. disc, grooves are spaced so that between 80 and 120 lines are accommodated to an inch. On the microgroove record, 350 lines per inch are considered the minimum. (Kinder)

MICROPHONE A device employed to pick up sound frequencies and to convert them to electrical variations for transmission on electrical cables. Microphones are available in a variety of designs and pickup or directional patterns. Accessories permit the use of booms, stands, and clips as supporting and manipulating arrangements. (Lewis)

MIL One-thousandth of an inch. Tape thickness is usually measured in mils. (USOE)

MIX To combine sound from two or more sources into a single recording (or output), usually with adjustment of tonal quality and/or relative volume level. (UFPA)

MIXER Device which permits the combining of two or more input signals at the same time into a recorder or audio system at the level desired. (USOE)

MODEL The voice or voices, preferably of native speakers, which are recorded as a guide for student practice. Also the utterances or basic material of each lesson which appear in dialogue form, narrative form, or in isolation and are used as models for the students. (USOE)

MONAURAL Recording or audio presentation with one or more microphones, but which is recorded or broadcast on only one track. (D & T Comm)

MONITORING In electronic learning labs, listening to the sound signal as it is being recorded or played back. A separate playback head on some recorders permits listening to the tape as the recording is made. Also, listening to students through the intercom during listen-speak practice or during record and playback of student practice responses. (USOE)

NARTB CURVE Standardized playback equalization curve set by the National Association of Radio and Television Broadcasters (the National Association of Broadcasters). (USOE)

OHM Practical unit of electrical resistance, being the resistance of a circuit in which a potential difference of one volt produces a current of one ampere. (USOE)

OPTICAL SOUND Sound which has been recorded and/or printed on photographic film by exposing and processing the light-sensitive sound track area. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Kinder)

OSCILLOSCOPE A test instrument, similar in some respects to a television receiver, that shows visual patterns of voltage and current characteristics. (Lewis)

OUTPUT (ELECTRONIC) Signal delivered from any audio device; also a jack or connector which feeds the signal to another piece of equipment. (USOE)

OVERLOAD More volume can be handled adequately without distortion in audio equipment. (D & T Comm)

P.A. See PUBLIC ADDRESS SYSTEM

PATCH CORD Connecting cable with a plug on each end for conveniently connecting two pieces of audio equipment. (USOE)

PICKUP A term sometimes applied loosely to the tone arm and cartridge of a phonograph. A cartridge, especially, containing the stylus (needle) and sensitive component for creating electric current. (Brown)

PLAYBACK Expression used to denote reproduction of the sound previously recorded. (USOE)

PLAYBACK HEAD See HEAD, PLAYBACK

PREAMPLIFIER Amplifier designed to raise very weak signals, such as those from a microphone or magnetic head, to a voltage level high enough for a power amplifier. (USOE)

PRESSURE PADS Small felt pads mounted on spring-brass arms which hold the tape in close contact with the heads during record and playback. (USOE)

PRESSURE ROLLER Rubber-tired roller which holds the tape tightly against the capstan to insure constant tape speed and prevent slippage. (USOE) T-164

PRINT THROUGH In tape recording, transfer of the magnetic field from layer to layer of tape on the reel during storage resulting in "echo" sounds on portions of the tape. (USOE)

PUBLIC ADDRESS SYSTEM Often abbreviated "P.A." An audio system for amplifying sounds of speech or music, usually composed of one or more microphones, an amplifier, and one or more loudspeakers. Some amplifiers are capable of accepting and amplifying music from tape recorders, phonographs, or radios. (Brown)

QUARTER-TRACK HEAD See HEAD, QUARTER-TRACK

RECORDER, DISK A device for reproducing sound on disks surfaced with acetate, or other plastic substance, in which grooves may be cut containing the physical representation of vibrations created by sound. A stylus vibrates to cut the signal and the groove. (Brown)

RECORDER, FILM A device for recording sound on film by photographic process. (Brown)

RECORDER, TAPE A tape unit, sometimes called a recorder/reproducer, which can record and playback. It contains recording and playback amplifiers and heads. The heads may be full-track, half-track, dual-track, or quarter-track. (USOE)

RECORDER, VIDEO-TAPE A device capable of recording both the audio and video signals of a television production on a special magnetic tape, which can be played back to reproduce the entire program. (Lewis)

RECORDER, WIRE A device for recording sound on a steel wire by placing magnetic fields on the wire. Tape recorders have supplanted wire recorders for most use. (Brown)

RECORDING, HEAD See HEAD, RECORDING

REEL, SUPPLY Reel which supplies film or tape as it is being recorded or played back. Also called "feed reel." (D & T Comm)

REEL, TAKE-UP Reel which receives film or tape as it is being recorded or played back. (D & T Comm)

RE-RECORDING See DUBBING

REWIND (1) (Verb) Act of returning recording tape or projection film from take-up reel to supply reel after playback or projection; (2) (Noun) Unit often built into recording or projection equipment, which, when threaded and electronically (or manually) activated, returns material to the supply reel. (D & T Comm)

R.P.M. "Revolutions per minute." Most commonly used in reference to phonograph turntable speeds when transporting disc recordings at speeds of $16\frac{2}{3}$, $33\frac{1}{3}$, 45, or 78 r.p.m. (D & T Comm)

SCANNING Systematic impingement on all parts of an area by a narrow beam of light, or other electromagnetic radiation, which is either initially modulated (optical sound recording) or which becomes modulated in the scanning process (television, optical sound pickup). (UFPA)

SCHEMATIC DIAGRAM Diagram that indicates by symbolic representation the connections and functional components of an electrical device. (USOE)

SHIELDING Enclosing wires or magnetic heads with metal to prevent stray currents from reaching them and causing hum. Most shields are "grounded." (USOE)

SLAVE UNIT Tape drive on which blank tapes are run for the purpose of simultaneously duplicating several copies of a master tape. (USOE)

SOLENOID Electromagnet which forces a piston to move by magnetic action when a current is introduced in order to activate a mechanical operation in a piece of electronic equipment. (D & T Comm)

SOLID-STATE ELECTRONICS Term used to describe a special type of small electronic component, such as transistors, which have no lighted or heated filament and which can be used instead of vacuum tubes in most electronic circuits. (USOE)

SOLID STATE LOGIC Utilization of solid state devices to perform logical functions as opposed to vacuum tube devices. (IBM)

SOUND A train of compressional waves transversing air (or other gaseous, liquid, or solid media) at some frequency or combination of frequencies within the audible range (approximately 12,000-18,000 cycles per second). (UFPA) T-166

SOUND EFFECTS Any sound from any source other than the dialogue, narration, or music in an audio presentation which enhance the illusion of reality. (D & T Comm)

SOUND-ON-SOUND Adding a new signal to a prerecorded signal as it is being played. Both signals are mixed and recorded together on a single track of another recorder. (USOE)

SOUND TRACK The portion of the motion picture film on which the sound is recorded, normally one band in 16mm along the edge opposite the sprocket holes. It may be optical or magnetic, or both, and with stereo sound may have two or more tracks. (See also VARIABLE AREA TRACK and VARIABLE DENSITY TRACK.) (Gordon)

SPLICE Joining two pieces of motion picture film or recording tape. Film splicing is accomplished by welding the the film ends together in a special machine, and with special cement, to ensure accurate joining. A special splicing tape is used to join pieces of recording tape. (Brown)

SQUEAL Noise caused by worn or dirty pressure pads or by tape which lacks special lubrication treatment. (USOE)

STANDARD SPEED A confusing term applied to phonograph records made prior to the advent of long-playing records; meant to describe the 78 r.p.m. speed. (Brown)

STEREO TAPE (FOUR-TRACK) See TAPE, STEREO (FOUR-TRACK)

STEREO TAPE (TWO-TRACK) See TAPE, STEREO (TWO-TRACK)

STEREOPHONIC Term denoting an audio technique or presentation in which two microphones are placed some distance apart and signals are fed simultaneously into two separate channels. Playback by broadcast, disc, or tape provides a dimensional effect when sent through two separate amplifiers and loudspeakers which are placed some distance apart for reproducing the two signals. (D & T Comm)

STROBOSCOPE A series of dots or parallel lines which appear to stand still when a turntable is rotating at the corresponding speed. (D & T Comm)

STYLUS A phonograph needle; also a needle for cutting recording disks. (Brown)

SUPPLY REEL See REEL, SUPPLY

TAKE-UP REEL See REEL, TAKE-UP

TALKING BOOK A microgroove disc prepared to play at a speed of $16\frac{2}{3}$ r.p.m. (Kinder)

TAPE CARTRIDGE Magazine or hard plastic case containing a reel (or two) of tape which is placed on a recorder without threading. Reel-to-reel cartridges allow the tape movement to be controlled in either direction. Endless-loop or continuous-loop cartridges can continue playing indefinitely but do not permit rewinding at will. (USOE)

TAPE DECK See TAPE TRANSPORT

TAPE, DUAL-TRACK or TWO-TRACK or HALF-TRACK MONAURAL Two full-length recordings--one on each half of the tape. In order to play the second track of a dual-track recording, it is not necessary to rewind the tape; merely switch the position of the feed reel and the take-up reel and rethread the machine. (ColoU)

TAPE, FULL-TRACK or SINGLE-TRACK A monaural recording which covers the full width of a recording tape. (ColoU)

TAPE, LEADER Special nonmagnetic tape attached to ends of the tape for identification and protection of the tape ends. (USOE)

TAPE, MAGNETIC See MAGNETIC TAPE

TAPE PLAYBACK Tape reproducer unit for playback only of pre-recorded tapes. It is not equipped to record. (USOE)

TAPE, PRERECORDED Tape which has a program already recorded on it or duplicated before use. (USOE)

TAPE RECORDER See RECORDER, TAPE

TAPE SPEED Tape moves past the recording head at a predetermined speed measured in inches per second (ips). The faster the speed, the better the audio quality or frequency response. Standard speeds are $1\frac{7}{8}$ ips, $3\frac{3}{4}$ ips, $7\frac{1}{2}$ ips, 15 ips and 30 ips. Most standard recorders use $7\frac{1}{2}$ ips and $3\frac{1}{2}$ ips. (USOE)

(Note: Corresponding standard speeds in centimeters per second are 4.75, 9.5, 19, 38, and 76.)

TAPE SPILLAGE Improper threading or poor adjustment of braking action or tension may result in spillage of tape. (USOE)

TAPE, STEREO (FOUR-TRACK) Also known as "quarter-track" or four separate monaural tracks; produced by recording four separate tracks on one tape. For stereo these tracks can be recorded in pairs running on each of two directions. In producing a stereo tape the first and third tracks are recorded in opposite direction. Monaural four-track recordings are made only one track at a time. (ColoU)

TAPE, STEREO (TWO-TRACK) Also referred to as "half-track stereo"; requires two, separate, parallel tracks on a single tape. This type of recording is similar to the dual-track recording except both tracks are recorded in the same direction and the tape must be rewound in order to play again. (ColoU)

TAPE TRANSPORT Also called a "tape deck" or "tape drive." Mechanism which moves the tape past the heads. It includes head assembly, motor and controls for tape movement. It does not normally refer to the electronic components which together with the transport mechanism constitute a tape recorder. (USOE)

TAPE, VIDEO A tape used in the process of recording picture and sound from television programs by a magnetic process similar to sound recording on tape. (Brown)

THREAD To place film or tape correctly in the prescribed path of a projector or tape recorder. (D & T Comm)

TONE ARM The movable arm on a phonograph which holds the needle that is used to pick up vibrations from the record grooves. (Kinder)

TRANSCRIPTION A term applied specifically to phonograph recordings originally designed for broadcast use. The discs, approximately 16" in diameter, are played at a speed of 33⅓ r.p.m. using a 3-mil stylus. Transcriptions were originally designed to provide approximately 15 minutes of time per side as convenience for radio-station scheduling. For school use, transcriptions are quickly being replaced by long-playing records. (Brown)

TRANSISTOR A small piece of germanium metal with unusual electronic properties which may eventually replace vacuum tubes in audiovisual equipment. One of the chief advantages lies in the fact that a small slug of this metal the size of a pencil eraser can do the work of the ordinary vacuum tube. (Kinder)

TUNER ADAPTER See CONVERTER

TURNTABLE The rotating disk of a phonograph upon which records are carried during play. (Brown)

VARIABLE AREA TRACK Any sound track recorded in the form of a modified photo-oscillographic trace more or less sharply divided longitudinally into two components, one essentially opague, the other essentially transparent. (UFPA)

VARIABLE DENSITY TRACK Any sound track in which a recorded sound is represented as full track width density variations extending along the length of the track. In variable density tracks the density range from a local maximal density to an adjacent minimal density is related to amplitude, while the spacing between adjacent local maximal (or minimal) densities is related to frequency. (UFPA)

VOLT The unit of electromotive force which will cause a current of one ampere to flow through a resistance of one ohm. (D & T Comm)

VOLUME INDICATOR See LEVEL INDICATOR

VU METER "Volume unit" meter which indicates the relative levels of the various sounds being recorded or played. (USOE)

WATT Unit of electrical power. Usually used to denote the output of speakers or the amount of current needed to operate a device. (USOE)

WOW A periodic disturbance in sound. Usually caused by regular variations in angular velocity of some mechanical component of the system. (UFPA)

5. PROGRAMED INSTRUCTION AND TEACHING MACHINES

ACQUISITION See TERMINAL BEHAVIOR

ADAPTIVE TEACHING MACHINE See TEACHING MACHINE

AUTO-INSTRUCTIONAL DEVICES (1) The technology of machines and systems devoted to mass instruction, including various applications of television and massed film systems, such as EBF's physics and chemistry series; (2) Those systems and machines for individual instruction, which include individual reading pacers, individual viewing and listening equipment, language laboratories, programed printed materials, and the true teaching machine of the Skinner or Pressey type, using verbal and pictorial programs with various ways, electronic and mechanical, for responding and being informed of errors and progress. (Finn)

AUTO-INSTRUCTIONAL METHODS Synonymous with "programed instruction, programed learning, automated teaching, self-instructional materials," etc. The term "auto-instructional" was proposed by Lumsdaine and Klaus to circumvent "misleading, prejudicial, or both" connotation attributed by them to the other labels. The teaching machine would be called an "Auto-instructional Device" (AID). (Markle)

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AUTOMATIC TUTORING The term for "programed instruction" most frequently used with "intrinsic programing." (Markle)

BRANCH A choice point at which students are sent to alternative items depending on their responses to the particular item. A common use of branching is in intrinsic programs, where the branch (or loop) consists of a single item explaining why a particular answer is incorrect and returning the student to the original item for another try. A criterion item may be inserted in a linear program and, if the student passes it, he may be sent forward several items (FORWARD BRANCHING): if he fails the criterion item, he takes an intervening sequence of review or remedial items. A student may, at a criterion item, be sent backwards in the program to repeat items he has already seen but inadequately mastered (BACKWARD BRANCHING or "WASHBACK"). Students may be "branched" on the basis of either constructed response or multiple-choice responses, although the latter predominate. (Markle)

CHAINING The linking together of a series of discriminable responses in a particular order. The completion of the first response is said to provide the stimulus for the second response. In typical laboratory examples, reinforcement is given at the end of the chain of responses. A classroom parallel can be seen in the solution of a long-division problem: each step in the procedure could be separately taught, even in a random order, but the final performance requires a prescribed order to achieve the solution. Providing a student with *knowledge of results* at the end of the solution sequence would parallel the provision of reinforcement following the final response in a chain. (Markle)

COMPOSED RESPONSE See RESPONSE, CONSTRUCTED

CONVERSATIONAL CHAINING A programing technique in which the correct answer to an item is not presented by itself but is rather embedded in the text of the following item. Consecutive items are thus closely linked by the necessity of repeating in the new item the word or words that were elicited in the previous item. The response to one item becomes part of the stimulus in the next. (See CHAINING.) The technique was developed and described by John Barlow. T-172
(Markle)

CRITERION See TERMINAL BEHAVIOR

CROWDER-STYLE PROGRAM See PROGRAMING, INTRINSIC

CUE See PROMPT

EGRUL See RULEG

ERROR A response not acceptable to the programer. Programers attempt to eliminate errors by revising the program. Erroneous responses may indicate (1) A poorly designed item which fails to communicate and therefore needs to be rewritten; (2) A sequence in which *prompts* have been faded too fast or inadequate practice given; (3) Assumed previous knowledge which in fact the student does not have; (4) Poor analysis of the subject matter, leading to a confusion not predicted by the programer. *Intrinsic programs* handle errors by *branching* students to simpler presentations (type 2) or to remedial sequences (type). *Linear programs* are revised to prevent such errors. Errors due to sources (1) and (4) are unacceptable to programers and teachers alike.

Confusion has been introduced by assumptions that the principle of errorless learning means that all responses must meet a criterion of unvarying precision. "False starts" such as a blind alley in trouble-shooting or problem-solving, a tentative generalization based on inadequate data, an over- or under-estimation in approximation, etc., are "mistakes" which may be valuable for training. (Markle)

ERROR RATE Generally, the percentage of incorrect responses on an item, a set of items, or a whole program. A relatively low error rate--and programers do not agree on the range that is "low"--is a necessary but by no means sufficient condition for a program to be considered acceptable. Spuriously low error rates are too easily attained by adding irrelevant easy items, testing with a pretrained population, removing terminal items, etc. (Markle)

FADING The gradual removal of the prompts in a sequence of items teaching a particular topic. Sequences typically begin with highly prompted items and end with unprompted terminal items. The word is sometimes used as a synonym of vanishing. (Markle)

FEEDBACK (PROGRAMING) A term borrowed from communication theory and used to describe some event which occurs as a result of or contingent upon the student's responses. It is not necessarily synonymous with reinforcement, since it is not defined by its effect on the recurrence of the response. In a trouble-shooting program, for instance, the response might be "I choose to measure A." Feedback would consist of "The value of A is X." The feedback does not indicate necessarily the rightness or wrongness of measuring A. (See KNOWLEDGE OF RESULTS.) A distinction is made by intrinsic programers.

FORMAL PROMPT See PROMPT

FRAME See ITEM

GROUP PACING See PACING

ITEM A segment of material which the student handles at one time. Items vary in size from a single incomplete sentence, question, or instruction to perform some response up to sizable paragraphs. In almost all programing methods, it will require at least one response and provide for knowledge of results before the student proceeds to the next item. (Markle)

KNOWLEDGE OF RESULTS A report to a student on the status of the response he made. It may take the form of a verbal report "Right" or "Wrong" (or lights, buzzers, etc., signaling these), or a display (oral or written) of the correct verbal response. It may be a response of a manipulandum, particularly in those cases in which the operation of a device is the subject matter. Some teaching machines advance to the next item only when the correct response has been given. Since knowledge of results has been shown to facilitate learning in many situations, it is generally considered a subclass of reinforcement. (Markle)

MACHINE PACING See PACING

PACING The rate at which the student proceeds through a given number of times. The usual procedure in programed instruction is SELF-PACING: the student reads and responds at his own rate. A stimulus device such as a film may be adapted to perform stimulus-response functions. If materials are presented by such a device to a group, the time allowed for the input and for responses has to be standardized, resulting in GROUP-PACING. A few devices, such as reading accelerators, control the individual student's pace by MACHINE-PACING, moving on to the next item irrespective of the student's behavior. (Markle)

PANEL A section of material available to the student while working through more than one item. The term has been used to include texts, diagrams, maps, globes, and laboratory equipment, any of which may be incorporated into a program. In discussions of programed textbooks, the term PANEL is used to refer to a single level in the horizontal format. Thus, such a text might be said to have three "panels" on a page--levels A, B, and C. (Markle)

PRESSEY DEVICE A multiple-choice device dating from the 1920's. Questions were presented either on a rotating drum or on separate sheets. The student selected an alternative and pressed a corresponding key. The machine was coded so that, if the student's response was correct, the device advanced to the next question; if the response was incorrect, an error was tallied and the device remained set for the question until the correct response was given. (Markle)

PROGRAM A sequence of carefully constructed items leading the student to mastery of a subject with minimal error. The distinguishing characteristic of programed materials is the testing procedure to which they are subjected. Empirical evidence of the effectiveness of each teaching sequence is obtainable from the performance records of the students. (See PROGRAMING, LINEAR, and PROGRAMING, INTRINSIC.) (Markle)

PROGRAMED INSTRUCTION The utilization of programed materials in achieving educational objectives. Synonymous with "auto-instruction, automated teaching," etc. (Markle)

PROGRAMED TEXT A book in which a program is printed. There are two typical formats: page-to-page and down-the-page. In a page-to-page text, the student turns the page after each item, finding the answer and the next item on the following page. Generally, items are arranged in levels. The student goes through the book doing all the items on one level, then repeats the process for each successive level. In a down-the-page format, the student is required to mask the answer column and in some cases, everything but the item he is working on as he reads down the page. The term "programed text" almost always refers to a *linear program*. (See SCRAMBLED BOOK.) (Markle)

PROGRAMER (PROGRAMED INSTRUCTION) The person responsible for the design of items and sequences in a program. The programer may be a psychologist working with a subject-matter expert who delineates the content, or he may be a subject-matter specialist trained in programing techniques. (Markle)

PROGRAMING, "ECLECTIC" A term for those programers not committed to a particular school of programing. The resulting programs may contain *ruleg* and *egrul* sequences, *multiple-choice* and *constructed-response* items, *branches* and *linear* sequences. (Markle)

PROGRAMING, INTRINSIC A programing technique developed by Norman Crowder, characterized by relatively lengthy items, *multiple-choice* responses, and consistent use of *branching*. If, after reading the information section of each item, the student selects the correct response to the question based on the material, he is sent to an item presenting new information. If he selects an incorrect alternative, he is sent to an item which provides information as to why his choice was incorrect. To the extent that the programer has correctly predicted the possible responses that the student population will make, the program taken by each student is under the control of his own responses, and will differ for students of differing abilities. (Markle)

PROGRAMING, LINEAR A technique of programing developed by B. F. Skinner. Set sequences of items present information in small units and requires a response from the student at each step. The steps are so designed that errors will be minimal for even the slower students in the target population. Every student does each item in the program, his progress differing only in the rate at which he proceeds through the sequence. Constructed responses are demanded of the student most of the time. (Markle)

PROMPT A stimulus added to the terminal stimulus to make the correct response more likely while the student is learning. It may be a pictorial or verbal. Prompts vary in strength, i.e., in the probability with which they will evoke the correct response from a given population. The term is used synonymously with CUE and is generally synonymous with the non-technical term "hint." Prompts were classified by Skinner into two major types: FORMAL PROMPTS provide knowledge about the form of the expected response, such as the number of letters, the initial letter, or the sound pattern (prompted by a rhyme); THEMATIC PROMPTS depend on meaningful associations which make the student likely to "come up with" the expected response. T-176

A distinction between PROMPT and CUE is made by some writers. The term "prompt" is used to describe the function of a model of the response which the student copies, while a cue is a hint of a weaker sort. (Skinner specifically excluded from the category "prompt" stimuli to be imitated.) This usage of the term parallels the laboratory technique of RESPONSE PROMPTING, in which a student is given a stimulus (a word or picture), is told the correct response ("prompted"), and repeats the response after the prompter. Note: since one use of the term specifically excludes that which the other use of the term includes, readers must determine which sense the author intends before interpreting one set of results as being in conflict with another. (Markle)

RATE See PACING

REINFORCEMENT A technical psychological term. It denotes a process in which some stimulus, presented immediately following a response, increases the rate at which the response is emitted in a standard situation or increases the probability that the response will recur when the situation recurs. A stimulus having such an effect is reinforcing or is a reinforcer. Knowledge of results (feedback or confirmation) has been shown to reinforce correct responses of students in many learning tasks. When the student's correct response is followed by presentation of the correct answer, the probability of correct response recuring is increased. When correct responses are not followed by knowledge of results, and when the student has no way of determining what is correct, learning does not occur. In these situations, the correct answer is a reinforcer.

Considerable confusion has arisen because stimuli such as food, praise, or money are sometimes called reinforcers even in situations where they are not effective, i.e., no learning occurs when they are present or the same learning occurs even when they are not present. Experimental findings suggest that presentation of the correct answer may not be operating as a reinforcer in programed instruction. Learning has been shown to occur without confirmation of correct responses. The extent to which the correct answer may truly be called a reinforcer remains to be demonstrated. Note: educators should be aware that the psychological use of the term "reinforcement" does not parallel their own use of it. The two definitions are quite distinct. In both cases, a response is strengthened, but the procedures differ. In educational parlance, repetition or rehearsal is the procedure denoted by "reinforcement." (Markle)

RESPONSE A technical psychological term used by programers to designate a wide variety of behavior. It may involve the production of anything from a single phoneme or letter, word or phrase, to the solution of a problem requiring an hour or more. It may involve selection among alternatives (multiple-choice) in which case the term "response" often includes the nonverbal manipulation of buttons, keys, etc. (Markle)

RESPONSE, CONSTRUCTED A response produced by a student to complete a sentence, solve a problem, or answer a question. A model of the response may be provided for the student to copy, but as long as he writes, says, or thinks it rather than selecting it from a set of alternatives, the response is constructed. (Markle)

RESPONSE, COVERT An internalized response which the student presumably makes but which is neither recorded nor otherwise available to an observer. A student who is producing an oral or written response must think of the response (i.e., respond covertly) before producing it. Experimentation is underway to determine the relative contributions of the covert and the overt components of responding in programs of various sorts and with students of various ability levels, etc. (Markle)

RESPONSE DEVICE See TEACHING MACHINE

RESPONSE, MULTIPLE-CHOICE The selection of one out of two or more alternatives provided by the programer for the student. The provision of the correct answer among the alternatives prevents the student from responding "in his own words" but does not necessarily produce a smaller step nor an easier item than some constructed-response items. The provision of incorrect alternatives, Skinner argues, may "strengthen unwanted forms of behavior," i.e., the student may retain the erroneous information despite the provision of or a discrimination between alternatives, the multiple-choice item seems the more efficient training and testing technique. (Markle)

RESPONSE, OVERT An oral, written, or manipulative act on the student's part which is, or can be, recorded by an observer. Whether such a response contributes significantly to learning or not, overt responses provide the data on the basis of which programs are revised. (Markle)

RESPONSE, PASSIVE Synonymous with RESPONSE, COVERT

RESPONSE PROMPTING See PROMPT

RULEG A systematic technique for constructing programed sequences, developed by Evans, Glaser, and Homme. All verbal subject matter is classified into (1) RU's: a class including definitions, formulae, laws, etc., and (2) EG's: a class including descriptions of physical events, theorems, statements of relationships between specific objects, etc. The latter provides examples (EG's) of the former class of statements. With this classification scheme, the authors recommend that programers introduce new information according to the formula "RU, EG, incomplete EG," the student's response being the completion of the incomplete example. For instance, the student could be given a spelling rule and a correctly spelled example of it and be required to spell a second such word. The advice has caused controversy. Some programers prefer an inductive approach, leading the student through a series of examples (EG's) before having him formulate the RU himself. This approach has been tagged "EGRUL." (Markle)

SCRAMBLED BOOK A book which presents an intrinsic program. The pages are not read consecutively. Following the information presentation, a multiple-choice question is given. The answer the student selects refers him to a particular page for confirmation or correction. He may be sent either forward or backward in the text, the number of pages in either direction being randomized. Thus no clue to which alternative is correct can be found in the page reference accompanying each alternative. (Markle)

SELF-PACING See PACING

SHAPING A training procedure in the psychological laboratory.
A complex performance is shaped by beginning with some T-179
response the animal is likely to make that is somewhat similar to or a small component to the desired terminal performance. The criteria for reinforcement are gradually shifted toward the complex behavior. For example, with turning a full circle as the terminal behavior, the trainer might reinforce a head motion as a first approximation, then wait until a step accompanies the head motion before delivering another reinforcement, then two steps, until the animal is turning a full circle. Parallels are drawn between this training procedure and programed sequences which begin with copying behavior and move through highly prompted items through fading to the final criterion performance. (Markle)

SKINNER DEVICE A class of devices providing a small space for information presentation, a small space for the student to write his response, and a mechanism for revealing the correct answer for comparison after the student has responded. The original model presented material printed on a disk (hence "disk" became synonymous with "lesson"), one segment or frame of which was visible, at a time. When the student exposed the correct answer, his response was simultaneously shielded under a transparent mask, preventing erasure. If the student scored his response as incorrect, the machine returned the item for a second try at a later time. Items scored as correct dropped out. Present versions of Skinner-type machines lack this "recycling" feature. (Markle)

SKINNER-STYLE PROGRAM See PROGRAMING, LINEAR

STEP An indefinite intuitive concept basic to programing. A subject to be programed is broken down into "steps." It is assumed that students cannot take later steps in a given sequence before taking the early steps. It is also assumed that each step represents a step forward. If students cannot respond correctly to an item, the item is "too large a step." The emphasis in linear programing is on "small steps" with a resulting low frequency of error. A step represents a combination of (1) A subjective judgment that an item represents progress in the student's mastery, and (2) An objective measure of the student's ability to respond correctly to the item. The size of the step is not necessarily related to the size of the response--a lengthy response may represent only a small step forward--nor is it necessarily related to the amount of material contained in an item. A programer generally increases the number of items in order to reduce the "size of the steps." (Markle) T-180

STIMULUS A technical term in psychology designating a class of events which impinge on an organism's sensory equipment and which experimenters can manipulate, describe, or hypothesize to exist. Stimuli are linked as observable (or hypothesized) antecedents to specific responses. In S-R (stimulus-response) psychology, the stimulus is a necessary antecedent to a response. Skinner's position places more emphasis on the consequent (reinforcing) stimuli than on the antecedents. In a program, the content of the item is the stimulus. This includes the terminal stimulus (the bare bones of the question or statement), any additional stimuli operating as prompts or models, and any external material such as panels. (Markle)

STIMULUS DEVICE See TEACHING MACHINE

STIMULUS-RESPONSE DEVICE See TEACHING MACHINE

STIMULUS, TERMINAL The unprompted question, incomplete statement, or problem to which the student is taught to respond. This stimulus may occur as part of a prompted item which is not, therefore, a terminal item. (Markle)

TEACHING MACHINE A device for presenting a program. Most machines control the material to which the student has access at any moment, preventing him from looking ahead or reviewing old items.

Many machines contain a response mechanism; a tape on which the student writes, a keyboard, or selection buttons. Some provision is made for knowledge of results, either by revealing the correct answer after the student responds or by advancing to the next item, thereby signaling correct completion of the previous item. A few machines score the student's response and tabulate errors. Machines are being developed which will select the next step on the basis of the student's response. This type of machine, in combination with a branched program, comprises what Stolurow calls an ADAPTIVE TEACHING MACHINE.

In Porter's terminology, a teaching machine is a STIMULUS-RESPONSE DEVICE providing immediate reinforcement. Such machines are distinguished from (1) STIMULUS DEVICES, such as films, phonographs, etc., which present information but make no provision for responses from the student, and likewise from (2) RESPONSE DEVICES such as typewriters which provide for practice but not forcontrolled input of information. A teacher may provide the missing half of either a stimulus device or a response device. (See PRESSEY DEVICE and SKINNER DEVICE.) (Markle)

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TERMINAL BEHAVIOR The behavior the student is expected to have acquired at the end of a program or programed sequence. Evidence that such behavior has indeed been acquired is provided by successful responses to TERMINAL ITEMS and/or by performance on a CRITERION TEST. The terminal items contain no prompts and are placed far enough from the training sequences to measure more than immediate memory. Criteria vary in testing of programs as they do in any other learning situation. Criterion tests may involve multiple-choice items, fill-in items, essays, or performance of some task. They may be given immediately after (ACQUISITION) or considerably later than the learning sequence (RETENTION). They may involve only the actual material explicitly covered in the learning sequence or they may involve extension, generalization, or application of the learned material, generally called TRANSFER. (Markle)

THEMATIC PROMPT See PROMPT

TRANSFER See TERMINAL BEHAVIOR

VANISHING A term originally designating the removal of more and more of the components of a specific chain of responses. In an example from Skinner, a student might be asked in the first frame to fill in a few obvious letters in a poem, then more letters, then words, phrases, and whole lines. When all components had been vanished, the student would be reciting the whole poem. The term is often used synonymously with fading, although the process of withdrawing prompts is not strictly parallel to the above process. (Markle)

WASHBACK See BRANCHING

6. BROADCASTING

AIRBORNE TELEVISION See STRATOVISION

AM RADIO See RADIO, AM

AMPLITUDE MODULATION (AM) A technical term used to denote standard radio. The low or medium frequency AM waves follow the curvature of the earth. (See also RADIO, AM.) (Kinder)

ANTENNA A conductor or system of conductors with which radio or television signals are received or transmitted through space. Some antenas are formed of suspended wires; others are formed of metal rods. In a microwave system a parabolic reflector or dish is employed for this purpose. (Lewis)

AUDIO VIDEO MIXER A device that combines the video signal from a TV camera and the audio signal from a microphone or similar source and impresses them on a carrier signal for transmission on a closed-circuit system. (Lewis)

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BALOPTICON An instrument for the projection of opaque materials. The current name for such a device is OPAQUE PROJECTOR (see glossary). Currently, in television production, a balopticon or "balop" projects opaque or flat illustrations. Originally, a trade name. (Brown)

BROADCAST The transmission of radio or television signals through space via electronic devices; also termed "wireless" transmission; the term "telecast" is sometimes used when restricted to television broadcast. (D & T Comm)

CABLE A series of conductors insulated from each other and arranged in a variety of patterns to perform transmission, control, audio, and power supply functions in an electrical system. Coaxial cable is designed to pass a wide range of frequencies and is particularly adapted to video and RF transmission applications. (See COAXIAL CABLE for further clarification.) (Lewis)

CAMERA CHAIN A television camera connected to a control unit and viewing monitor. (Lewis)

CARRIER WAVE In radio or television broadcasting, the wave whose amplitude, frequency or phase is varied or modulated to transmit a signal or combination of signals. (D & T Comm)

CCTV See CLOSED-CIRCUIT TELEVISION

CENTRAL SOUND SYSTEM An intercommunication system used in schools, or other large institutions, which permits messages, music, or programs to be transmitted to rooms throughout a building or group of buildings. Provides communication for administrative or instructional purposes. (Brown)

CHANNEL (RADIO/TV) A specific band of frequencies assigned to each radio or television station. In some closed-circuit applications, the video and audio signals are fed into an audio mixer tuned to a specific channel, enabling the signals to travel by means of a coaxial-cable system rather than through space. (Lewis)

CLOSED-CIRCUIT TELEVISION A modified type of television in which the signals are transmitted by coaxial cables instead of sound waves. These telecasts are limited in range and, since they are not broadcast on the air waves, no license is required. (Kinder)

COAXIAL CABLE Designed to carry many radio, telephone, and television signals simultaneously, if desired. Technically, a central conductor or wire surrounded by some type of insulation over which a wire mesh or tube is placed. The central wire and outside conductor are concentric and serve as the conductors. (Lewis)

CONSOLE, CONTROL See CONTROL CONSOLE

CONTINUITY As used in connection with scripts for radio, television, or film production. A specific outline of the sequence of events to be presented. (Brown)

CONTROL CONSOLE A piece of equipment that incorporates monitors for viewing separate images picked up by various TV cameras in a system, in addition to the switching and other control devices required. When remote-controlled cameras are used, special iris, lens focus, and pan-tilt circuits are included. (Lewis)

CONTROL ROOM Usually located adjacent to, or as part of, a television, radio or electronic learning lab or studio, with glass panels installed to permit visual contact between the two areas. Contains control console, audio equipment, and other accessories employed by the director, teacher, and/or staff. (D & T Comm)

CONVERTER An electronic device capable of changing radio and television signals from one class of frequencies to another. Attached to a TV receiver, a converter allows a VHF set to tune in UHF channels. Similarly, a converter installed at the antenna site can perform the same function to permit distribution of the modified signals to many television receivers not ordinarily equipped to receive such signals. (Lewis)

DATA-REMOTING The storage and handling of data through mechanical-electronic systems. Permits electronic distribution of recorded images without removing the original material from the depositry. (Lewis)

DATA-STORAGE TUBE A modified TV kinescope or picture tube equipped to retain selected images for as long as desired. (Lewis)

DOCUMENTARY The term to describe the type of motion picture or TV program that purports to show reality and in which techniques are secondary to the theme. (Gordon)

EDUCATIONAL STATION A broadcasting station (AM, FM, TV) operated on a non-profit basis in the interests of cultural development. It accepts no advertising. (Kinder)

EDUCATIONAL TELEVISION (ETV) (1) Any broadcast or closed-circuit television program which provides informal enrichment or peripheral enlightenment; (2) A generic term often applied to any television program related to some form of instruction. (See also INSTRUCTIONAL TELEVISION or ITV) (D & T Comm)

EFFECTIVE RADIATED POWER (ERP) The energy actually transmitted in the horizontal plane from the antenna of an FM or television station. (Lewis)

EIA (RETMA) STANDARDS A set of criteria and standards worked out by research committees to arrive at a working basis for commercial broadcast television equipment--both transmission and reception. The Electronics Industry Association (EIA), formerly known as RETMA, was responsible for activating this important work. Equipment not meeting EIA standards cannot be used for conventional telecasting purposes. (Lewis)

ETV See EDUCATIONAL TELEVISION

FACSIMILE An electronic system for transmitting pictures and graphic materials over very high frequency air waves. (Kinder)

FADER An electronic control that progressively decreases the intensity of an image picked up by a TV camera. This procedure can be continued until the image on the screen disappears entirely, or the process can be reversed to fade in another image. (Lewis)

FCC Abbreviation for Federal Communications Commission, a regulatory agency created by Congress in 1934. (D & T Comm)

FILM CHAIN An equipment arrangement in which one or more 16mm film projectors are directed in turn to provide image pickup for a television camera. This may include the projector, multiplexer, and TV camera. (Lewis)

FM RADIO See RADIO, FM

FREQUENCY MODULATION (FM) A high frequency radio wave in which the amplitude is kept constant and the vibrations fluctuate. FM usually means clearer, staticless radio; the sound waves travel in a short straight line. (See also RADIO, FM) (Kinder)

HEADPHONE (Also called "headset") A device consisting of one or two telephone receivers connected to a headband for individual listening to audio sources, such as intercommunication circuits. Some headsets or headphones are equipped with a small microphone to permit two-way communication. (Lewis)

IMAGE ORTHICON A highly sensitive TV camera tube used extensively in studio cameras, as well as for field applications. (Lewis)

INSTRUCTIONAL TELEVISION or ITV Any closed-circuit or broadcast television program which provides formal instruction, usually for credit. (See also EDUCATIONAL TELEVISION or ETV.) (D & T Comm)

INTERCOMMUNICATION SYSTEM Usually a two-way "intercom" audio network which permits "talk-back" between the teacher and student in an electronic learning laboratory or remote classrooms on a closed TV circuit; also audio connection between a TV or radio director and crew members. (D & T Comm)

IONOSPHERE An outer belt of the earth's atmosphere which is ionized or electrically excited by radiations from the sun or interstellar space; varies in height from several hundred miles high during the day to 25-50 miles after sunset. Reflects lower frequency radio waves such as standard AM or shortwave back toward the earth and thus extends broadcast coverage increasingly as it lowers. (D & T Comm)

ITV See INSTRUCTIONAL TELEVISION

KILOCYCLE A measurement unit equal to 1,000 cycles per second and used to express the frequency of radio and other electromagnetic waves. (Lewis)

KINESCOPE The kinescope is the picture tube of a television receiver. However, recently the term has been applied to the motion picture films made by photographing the images produced on the "kinescope," or picture tube. (Cross)

LINE-OF-SIGHT A term popularly employed to describe transmission characteristics of UHF television channels and other high-frequency bands (such as FM). Such frequencies are usually limited in transmission range by straight-line distances between the radiating antenna and the receiving antenna. Natural or man-made obstructions existing between the sending and receiving positions further limit coverage. (Lewis)

"LIVE" PROGRAMS Programs which are broadcast at the point and time of origin. (Kinder)

LOW-POWER TELECASTING Under amended rules of the FCC, TV stations can now be operated with as little as 100 watts of effective radiated power. Prior to this ruling the minimum ERP was 1,000 watts. (Lewis)

MAGNETIC TAPE An acetate or plastic ribbon coated on one surface with tiny iron oxide particles. The ¼" width tape is ordinarily employed for magnetically recording audio for subsequent reproduction. Special tapes of greater width are used for magnetic storage of data in computers. The most recent development is the 2" width used in video tape recording the entire television program, including the audio, video, and synchronizing and control signals. (Lewis)

MASTER ANTENNA SYSTEM An arrangement designed to eliminate need for individual antennas for each television reciver. Antennas are arranged to pick up television signals in a given service area and are connected to an amplification and distribution network to provide optimum signals to multiple locations within one or more buildings. (Lewis)

MEGACYCLE A unit equal to 1,000,000 cycles per second; used to express the frequency of radio, television, and other electromagnetic waves. One megacycle is equal to 1,000 kilocycles. (Lewis)

MICROPHONE A device employed to pick up sound frequencies and to convert them to electrical variations for transmission on electrical cables. Microphones are available in a variety of designs and pickup or directional patterns. Accessories permit the use of booms, stands, and clips as supporting and manipulating arrangements. (Lewis)

MICROWAVE Transmission of electrical signals through superhigh frequencies. (D & T Comm)

MICROWAVE RELAY A series of high-frequency directional transmitters and receivers strategically spaced to permit the successive reception and retransmission of radio and television signals through space between widely separated points. (Lewis)

MOBILE UNIT A truck or trailer equipped with television or radio units to permit the pickup of programs in the field. Some units are equipped with microwave facilities to communicate with the home-base station; other arrangements comprise a mobile studio. (D & T Comm)

MONAURAL Recording or audio presentation with one or more microphones but which is recorded or broadcast on only one track. (D & T Comm)

MONITOR A high-definition TV viewer connected directly to the camera output. A true monitor does not incorporate channel selector components or audio components. In some closed-circuit applications, monitors are used where high definition in the reproduced image is necessary. (Lewis)

MULTIPLEXING See SIGNAL MULTIPLEXING

NARTB CURVE Standardized playback equalization curve set by the National Association of Radio and Television Broadcasters (the National Association of Broadcasters). (USOE)

OPEN-CIRCUIT Refers to broadcast situations where programs are radiated for reception by any listener or viewer within range of the station. Applies to commercial and educational television and radio stations. (Lewis)

OSCILLOSCOPE A test instrument, similar in some respects to a television receiver, that shows visual patterns of voltage and current characteristics. (Lewis)

P.A. See PUBLIC ADDRESS SYSTEM

PUBLIC ADDRESS SYSTEM Often abbreviated "P.A." An audio system for amplifying sounds of speech or music, usually composed of one or more microphones, an amplifier, and one or more loudspeakers. Some amplifiers are capable of accepting and amplifying music from tape recorders, phonographs, or radios. (Brown)

RADIO, AM Radio transmission on wave lengths between 550 and 1,600 kilocycles. AM stands for "amplitude modulation," a procedure for transmission of radio signals usually used on the bands mentioned. Most widely used radio broadcast system in the United States. (See also AMPLITUDE MODULATION.) (Brown)

RADIO, FM Radio bands from 88 to 108 megacycles, using a particular kind of propagation and transmission of radio signals. FM represents "frequency modulation." FM is characterized by high-quality, noise-free transmission. Television sound also is broadcast by FM transmission. (See also FREQUENCY MODULATION.) (Brown)

RADIO FREQUENCY Part of the electromagnetic spectrum where bands of frequencies, or channels, are allocated for radio and television use. (Lewis)

RECEIVER (BROADCAST) Electronic instrument whose antenna intercepts the carrier wave of a radio or TV station to which it is tuned, amplifies the signal, and translates the electrical energy into sound and, where applicable, picture. (D & T Comm)

RECEIVER, "JEEPED" (TELEVISION) A regular receiver that has been modified to permit it to be used as a monitor for direct-video purposes in a closed-circuit system. This is accomplished through by-passing most of the circuit elements and feeding the picture signals directly into the video amplifier. When this is done, it is necessary to provide a separate audio source. Some receivers on the market can be used conventionally or "jeeped" according to need. (Lewis)

RECEIVER, PROJECTION (TELEVISION) A television set with a small but high-intensity picture tube. The tube operates through an optical system to project images which are viewed on a screen. Some recent developments employ different approaches to achieve this effect. (Lewis)

RECORDER, VIDEO-TAPE A device capable of recording both the audio and video signals of a television production on a special magnetic tape, which can be played back to reproduce the entire program. (Lewis)

RESOLUTION Ability of a television system to distinguish and reproduce fine detail in the subject picked up by the camera. (Lewis)

RF See RADIO FREQUENCY

SATELLITE COMMUNICATION The use of one or a series of orbitting man-made satellites which are equipped to receive, amplify, and re-transmit (or merely reflect from its surface) microwave signals from and to specially-adapted transmitters and receivers several hundred or thousand miles apart; first experimental application for transmission of radio, television, and telephone signals between Europe and the United States made by Telstar satellite in July 1962. (D & T Comm)

SCANNING Systematic impingement on all parts of an area by a narrow beam of light, or other electromagnetic radiation, which is either initially modulated (optical sound recording) or which becomes modulated in the scanning process (television, optical sound pickup). (UFPA)

SCRIPT A set of written specifications for the production of a motion picture, television program, or other rendition or a presentation; includes narration and presentation layout. (D & T Comm)

SHADOW AREA Due to TV transmission characteristics, particularly on UHF channels, some communities do not receive satisfactory signals from television stations because of natural barriers, such as mountains and terrain variation. The areas where the signals cannot get through are known as "shadow areas." (Lewis)

SIGNAL (BROADCAST) The waves, impulses, sounds, pictures, etc., transmitted or received; the wave which modulates the carrier wave. (D & T Comm)

SIGNAL MULTIPLEXING A device for the mixing of several signals for transmission over a single system. Microwave relays are often multiplexed to carry video and audio signals simultaneously. (Lewis) T-191

SIMULCAST The simultaneous transmission of the same program over two different stations. In some instances, this is done with a pair of AM and FM stations, or the audio portion is broadcast over a radio station while the complete program is sent out over a television station. (Lewis)

SOUND A train of compressional waves transversing air (or other gaseous, liquid, or solid media) at some frequency or combination of frequencies within the audible range (approximately 12,000-18,000 cycles per second). (UFPA)

SOUND EFFECTS Any sound from any source other than the dialogue narration, or music in an audio presentation which enhance the illusion of reality. (D & T Comm)

STEREOPHONIC Term denoting an audio technique or presentation in which two microphones are placed some distance apart and signals are fed simultaneously into two separate channels. Playback by broadcast, disc, or tape provides a dimensional effect when sent through two separate amplifiers and loudspeakers which are placed some distance apart for reproducing the two signals. (D & T Comm)

STRATOVISION The use of high-flying aircraft to retransmit television programs originating from ground base stations or to transmit directly from video tape systems. (Latter is employed by the Midwest Program on Airborne Television Instruction.) (D & T Comm)

SUSTAINING PROGRAMS Programs which are not paid for by a sponsor, but are put on the air as a service by the broadcasting station (e.g., early morning instructional broadcasts on television). (Kinder)

SWITCHER, CAMERA A set of push buttons mounted on a box or panel that allows selection of the television image from any of several cameras. The image can then be fed into a closed-circuit distribution system or to a broadcast transmitter. (Lewis)

SYNCHRONIZED MOTION PICTURE PROJECTOR A motion picture projector that is specially equipped with a speed and shutter mechanism that is compatible with the television frame and scanning system. The use of nonsynchronous projectors ordinarily results in interference patterns on the reproduced images. (Lewis)

SYNCHRONIZING GENERATOR An electronic generator that supplies pulse patterns for the control of television circuits. EIA (RETMA) pulses are required for on-the-air broadcast; random or non-EIA pulses may be employed for local systems of a closed-circuit nature. (Lewis)

TALK-BACK Use of an intercommunication system to provide voice contact between the television director and the crew or, in some closed-circuit applications, to permit students in remote classrooms to ask questions of the television instructor. (Lewis)

TAPE, VIDEO A tape used in the process of recording picture and sound from television programs by a magnetic process similar to sound recording on tape. (Brown)

TELECOURSE A full sequence of lessons offered over closed-circuit or broadcast television for credit or for auditing purposes. Depending upon the individual institution sponsoring the activity, written requirements, reading assignments, and examinations are included. (Lewis)

TELEGUIDE A study guide for a forthcoming telecast. (Kinder)

TELEPROMPTER A mechanical "cue" feeder to television actors (or teachers) has been broadened and developed into one of the effective mechanical aids available to speakers (or lecturers).

Large typed words, eight times the size of regular typewriter type, unroll through a compact unit in front of the speaker. The typed words, on a long roll of paper, enter the speaker's field of vision at a rate of speed controlled by either the speaker or an assistant.

It is possible to go back in the speech or go forward at an accelerated rate if the occasion demands.

Using more than one unit in synchronization, the speaker can apparently look the audience in the eye as his eyes travel back and forth from the multiple teleprompters placed to the left and right of the lectern.

By incorporating a set of solenoid switches in one of the teleprompters and placing thin strips of adhesive-backed aluminum foil on the roll of teleprompter paper at the cue words, to activate the switches, recorders, projectors, and room lights can be turned off and on in synchronization with the speaker's delivery. (See also TELEMATION.) (ANA)

TELOP An opaque projector arranged to project images picked up by reflecting light from the surface of opaque graphics, such as pictures, drawings, typed material. It is not necessary to employ slides or other transparencies with unit. A part of a multiplexer arrangement, the "Telop" feeds projected images to the television camera (Lewis)

TRANSLATOR An electronic device capable of receiving a television transmission from a VHF station and converting it for retransmission on a UHF channel. A translator can also be used to pick up a program from a UHF channel and retransmit it on a different UHF channel. (Lewis)

TRANSMISSION LINE A conductor system designed to transmit electrical impulses from one location to another. This may be the line connecting the transmitter to the antenna or the coaxial cable linking separated locations. (Lewis)

TRANSMITTER (BROADCAST) A general term applying to the equipment necessary to radiate radio or television signals into space for reception at locations within the service area. (Lewis)

TUNE ADAPTER See CONVERTER

UHF Abbreviation for ULTRA HIGH FREQUENCY

ULTRA HIGH FREQUENCY Wave lengths reserved for commercial and educational television which lie in the wave bands of 300 to 3000 megacycles. Includes channels 14-83. Less powerful than VERY HIGH FREQUENCY. (D & T Comm)

VERY HIGH FREQUENCY Wave lengths reserved for commercial and educational television which lie in the wave bands of 30 to 300 megacycles. Includes channels 2-13. More powerful than ULTRA HIGH FREQUENCY. (D & T Comm)

VHF Abbreviation for VERY HIGH FREQUENCY

VIDEO Refers to the visual components of a television system. Video frequency is the range obtained from scanning by a TV camera tube. The highest value is restricted to 4 megacycles. This does not include provision for sound or audio components. (Lewis)

VIDEO TAPE RECORDER See RECORDER, VIDEO-TAPE

VIDEOGRAPH A system of quickly reproducing opague, permanent copies of images appearing on a special television tube. (Lewis)

VIDICON A television camera tube of much smaller physical size than the image orthicon. The vidicon requires more light for comparable operation but is less expensive in cost and operation. (Lewis)

VIEW FINDER (ELECTRONIC) A small picture tube built into a television camera and connected to the pickup circuits, thus enabling the camera-man to see exactly what is being scanned by the camera. (Lewis)

VIEWFINDER (OPTICAL) A camera component arranged to indicate the boundaries of the camera's field of view. External viewfinders may be as simple as an open wire loop used with a properly spaced pupil for viewing, or it may be an elaborate device with provision for altering the boundaries of its field to correspond with the field of any of several camera lenses. External viewfinders, to be accurate, must be corrected for parallax. This possible error in framing is obviated in the case of a type of integral viewfinder which can be moved into position for viewing the field through the camera lens. (See also PARALLAX AND REFLEX CAMERA.) (UFPA)

7. COMPUTERS IN INSTRUCTIONAL SETTINGS

ANALOGUE COMPUTER Computer system or machine whose input and output are basically continuous variables--usually measurements, length, depth, temperature, etc. There is no point at which absolute values are considered available as absolute. (IBM)

BAND A group of tracks, usually on a drum, used to store characters in serial fashion. The bits comprising one character are stored in parallel, one track for each bit. (IBM)

BINARY NUMBER SYSTEM Compared with the usual decimal system--which has none digits and a zero--the binary system has only one digit, 1, and a zero. Thus, the first ten whole numbers of the binary number system (with their everyday equivalents in parenthesis) are: 0 (0), 1 (1), 10 (2), 11 (3), 100 (4), 101 (5), 110 (6), 111 (7), 1000 (8), 1001 (9), 1010 (10). The binary number system is used in many electronic computers and in information theory. (English)

BIT (1) A unit measure of amount of information: the bit is that amount which, put into a given assemblage consisting of a known number of alternative outcomes for a certain event, reduces the alternatives by one-half. (If we are tossing a coin, the chances of getting head or tail are even. To reduce the alternatives by one-half, i.e., to specify that the coin will fall head, not tail, requires one bit of information. The formula is bit = $\log_2 k$, where k is the number of alternatives.) (English) (2) The smallest part of the array which can be interpreted: e.g., coded characters in the form of an array consisting of (seven) bits; each bit can be either 1 or zero. (IBM) T-195

BLOCK SORT To break a deck of data cards into decades by the highest order code digit so that smaller groups can be handled and work expedited by feeding sequenced data to a succeeding procedure step more quickly. (IBM)

CARD PUNCHING UNIT Machine for taking data and converting the data into coded holes in standard cards. (IBM)

CARD READING UNIT A unit which reads holes in standard cards. (IBM)

CHANNEL (DATA PROCESSING) A shielded line over which pulses travel from one unit to another within the calculator. (IBM)

COMPUTER A device which can accept information and supply information. The supplied output information is derived from the accepted input information. (IBM)

CONTROL PANEL The nerve system of accounting machines. These panels are plugged with wires that relay data from the cards to the various machine functions to render desired results. (IBM)

DATA PROCESSING The gathering, storing, and processing of numerical and alphabetical information of a business or scientific nature. (IBM)

DIGITAL COMPUTER A computer which operates with clearly defined or discrete numbers, as opposed to physical quantities of variables, which are used in an analogue computer. (IBM)

DRUM A constantly rotating cylinder with a magnetic surface on which data is stored by magnetizing spots on this surface using read-write heads staggered about its periphery. (IBM)

ERASE In tape recording, to remove the magnetic pattern on a tape by placing the tape in a strong magnetic field. On tape recorders, this is done by an "erase head." Tapes are also erased in a few moments on a bulk eraser. (Brown)

FIELD In data processing, name given to the smallest completely significant piece or section of data. (IBM)

FIELD DISTRIBUTION In data processing, the spreading of data from one field into several for printing, punching, or accumulating in accordance with signals from the cards. (IBM)

FIELD SELECTION In data processing, the channeling of differing data locations into one field for printing, punching, or accumulation.

HOPPER In data processing, the input receptical on the card-feed of a machine. (IBM)

INFORMATION RETRIEVAL The process of storing large quantities of information and selectivity retrieving this information under computer control. (IBM)

INPUT (DATA PROCESSING) Any data in any of several possible forms which is introduced into and acted upon by the calculator to produce a particular result. (IBM)

INSTRUCTION In data processing, the name given to the coded group of characters recognized by the calculator to perform any specific operation. Composed of two groups, an operation code (what is to be done) and address (where reference is to be made in memory). (IBM)

INTERPRET A machine operation to convert the punched data in a card to one of two printed lines (or both) on the face of the card. (IBM)

LINE PRINTER In data processing, a printer mechanism that prints complete multi-character lines of printing, one after the other. (IBM)

LOGIC The process of determining by deductive reasoning, the means for obtaining a desired result from a given set of conditions. (IBM)

LOGIC DEVICE Mechanical or electronic device which can perform any one of the 16 basic logical functions. Has two stable states--either on or off--a decision element. (IBM)

MACHINE PROGRAM A sequence of step-by-step operations which is to be performed by the computer in order to solve a problem. (IBM)

MAGNETIC CORES Powdered magnetic oxides pressed into the shape of donuts and capable of being magnetized in either of the two circumferential directions. Those used in computer storage units are about the diameter of a pencil lead. (IBM)

MARK SENSE (PARALLEL PUNCHES) The sensing of discretely placed graphic marks on a card to cause the punching of the marked data. (IBM)

MASTER CARD A punched card storage means for common data that has frequent use. (IBM)

MEMORY Shortened name for storage devices' locations in general. The name doesn't imply any particular device as much as it implies storage of some data where it will be accessible when needed. (IBM)

MEMORY DRUM A mechanical device for the serial presentation of memoranda for regulated periods and at regulated intervals. (English)

MEMORY FILE A large bank of memory cores where information is stored. (IBM)

MERGE (COLLATOR) The filing together of two decks of cards in the same sequenced order. (IBM)

OPTICAL SCANNER In data processing, the electronic process of "reading" or recognizing written symbols by reflecting light from the written page through an optical system to a light sensitive device. This device converts the reflected energy into electrical impulses which may be transmitted as a digital representation of the information on the written page. (IBM)

OUTPUT (DATA PROCESSING) Any media which contains the finished product (or partially finished product) of a calculating machine process. (IBM)

PHOTOSCOPIC MEMORIES A glass disk on which information is stored photographically in binary form. This information can be read out by a beam of light. It is presently being used in language translation. (IBM)

PROCESSING, DATA See DATA PROCESSING

PROGRAMER (COMPUTER) Individual who prepared instruction sequences and who develops the step-by-step operations which are to be performed by the computer in order to solve a problem. (IBM)

RANDOM ACCESS The name applied to the ability to go to any storage location at any time and with equal facility and get a piece of information. Access time is a further consideration. (IBM)

REGENERATE To read information out of a storage unit, and then after amplification, read it back into the same storage location. (IBM)

RETRIEVE (RETRIEVAL) When a message is stored it is obvious that certain operations must be carried out to ready it for being displayed. These operations constitute the act of retrieval. This act includes such operations as initiating the retrieval operation and transportation from the point of storage to the point of display. (TerLouw)

SEARCH The operation of determining whether certain information is in storage, the manner in which it is organized and where it is located. As information is stored in a wider diversity of forms, the problem of search becomes increasingly complex. Another complicating factor is the need to include in the search procedure such considerations as the character of the audience for which the message is designed and the task it proposes to do. (TerLouw)

SOLID-STATE ELECTRONICS Term used to describe a special type of small electronic component, such as transistors, which have no lighted or heated filament and which can be used instead of vacuum tubes in most electronic circuits. (USOE)

SOLID STATE LOGIC Utilization of solid state devices to perform logical functions as opposed to vacuum tube devices. (IBM)

SORTER-COLLATOR In data processing, a special machine built to handle specific jobs of sorting and collecting as determined by a code. (D & T Comm)

STACKER The output receptacle for cards on a card feed. (IBM)

STORAGE Implies some method of keeping data for future reference. For example, in computer processing--permanent storage on tapes, intermediate storage on drums and rapid access storage on magnetic cores. (D & T Comm)

STORE (STORAGE) The interval between the creation of the message as a unit or organized data or information and its presentation to the senses of the individual. In direct speech or a live demonstration the delay is zero. However, both events can be stored for delayed read-out by appropriate methods. The information loss characteristic of the storage system is a factor to be considered. Space occupied by the stored information is another significant factor. (TerLouw)

SWITCHING CIRCUITS A circuit which causes a start-and-stop action, or a switching action, by electronic means. In computers, this is performed automatically by the presence of a certain signal, usually a pulse signal; when combined, they can perform a logical operation. (IBM)

SYMBOLIC LOGIC The process of describing logic in terms of standard symbols so as to facilitate the reasoning process used in obtaining a result. (See LOGIC.) (IBM)

SYSTEMS ENGINEER Studies problems in industry, science, business, and government, and then organizes electronic data processing techniques and machine systems to solve them. He works at the source and with management in the organization concerned. (IBM)

TABULATE (PRINTER) The printing of group totals with a coded or alphabetical description. This differs from listing in that the individual cards are not shown but are rather hidden in the total. (IBM)

WRITE The process of storing a number on the surface of a magnetic tape, a magnetic drum, or a cathode ray tube. (IBM)

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8. ELECTRONIC LEARNING LABORATORIES

AUDIOACTIVE Term sometimes used to refer to listening-speaking practice. Also used to describe facilities in which students are equipped with headphones, preamplifier, and microphone by means of which the student's voice is amplified and carried simultaneously to his own headphones as he speaks. (USOE)

AUDIOLINGUAL New term which replaces "aural-oral" and refers to that element of language (sound) which is spoken in normal everyday conversational interchange as differentiated from language as gesture or as writing. (USOE)

AUDIOPASSIVE Terms sometimes used to refer to listening practice when no oral response is expected. Also used to describe facilities in which students are equipped with headphones only. (USOE)

BOOTH Sound-treated cubicles for student stations in electronic learning laboratories. The acoustical partitions are usually on three sides. The front partition may be a collapsible, sliding, or folding panel or it may be made of transparent materials such as plexiglass. (D & T Comm)

CHANNEL, DUAL (TAPE RECORDER) Usually a stereophonic (dual-track) recorder adapted so that two separate channels (program signal and student signal in an electronic learning laboratory) are recorded simultaneously or sequentially on two separate tracks of the same tape. Special switches and circuitry allow the student channel to be rerecorded without erasing the program channel. (USOE)

CHANNEL, MULTI (TAPE RECORDER) When applied to program source, this means that several sources can be transmitted simultaneously to selected student positions in the language (or learning) laboratory network. When referring to a recorder, it means that several different signals or channels are recorded or played back simultaneously but separately through a multitrack recorder. (USOE)

COMPUTER A device which can accept information and supply information. The supplied output information is derived from the accepted input information. (IBM)

CONSOLE, TEACHER Teacher's control center (in an electronic laboratory) where a distribution panel controls the transmission of program signals, and may include facilities for two-way intercommunication with individual students or an entire group. (USOE)

CONTROL ROOM Usually located adjacent to, or as part of, a television, radio or electronic learning lab or studio, with glass panels installed to permit visual contact between the two areas. Contains control console, audio equipment, and other accessories employed by the director, teacher, and/or staff. (D & T Comm)

CROSS-TALK Interference of one channel with another. Leakage of sound in a system as when one student hears an additional program signal or another student through his headphones. (USOE)

DATA-REMOTING The storage and handling of data through mechanical-electronic systems. Permits electronic distribution of recorded images without removing the original material from the depositry. (Lewis)

DATA-STORAGE TUBE A modified TV kinescope or picture tube equipped to retain selected images for as long as desired. (Lewis)

ELECTROMECHANICAL Refers to devices whose functions are accomplished by interrelated mechanical and electrical (or electronic) processes. Sometimes used to denote any of the audio or audiovisual components of electronic learning laboratory facilities, such as tape recorders, headphones, microphones, etc. (D & T Comm)

ELECTRONIC LEARNING LABORATORY Basically, a series of tape recorders, earphones and microphones, connected by wire to a console where switches permit the instructor to communicate with (1) All students simultaneously; (2) Groups of selected students, and (3) One student, individually.

The instructor may also distribute a single tape to all students or several, different master tapes to selected individuals. In some laboratories each student may have his own individual master tape to which he listens, orally responds and sometimes (according to instructions) records his oral responses. Most electronic laboratories place the tape recording mechanism at the student's desk. Each desk is isolated by sound dampened panels. In addition, the student is provided with a microphone and earphones. Recently, remotely controlled recorders, boom microphones fastened to the earphones headset along with the elimination of isolation panels have been installed to provide improved instruction. Supplemental studies demonstrate that greater efficiency is provided when visual materials are presented to either the entire group or to each student individually.

Experimentation since 1958 has provided evidence that these facilities can be utilized effectively for the teaching of foreign languages; reading; spelling; grammar and punctuation; music appreciation and criticism; English literature; social studies; stenography; and speech. (Oxhandler)

HEADPHONE (Also called "headset") A device consisting of one or two telephone receivers connected to a headband for individual listening to audio sources, such as intercommunication circuits. Some headsets or headphones are equipped with a small microphone to permit two-way communication. (Lewis)

HUMAN ENGINEERING (1) An applied science, participated in jointly by psychologists and engineers, concerned with the design of equipment and the arranging of the physical conditions of work in relation to human sensory capacities, psychomotor abilities, learning capacities, body dimensions, comfort, safety, and satisfactions; (2) The art of managing men as the engineer manages materials. (First definition preferable.) (English)

IMMEDIATE PLAYBACK New development in recorders for language learning which can play back each segment (variable lengths) of program-stimulus and student-response immediately or instantaneously after the student response without rewinding the tape or reversing its direction. (USOE)

INSTRUCTIONAL MEDIA Devices which present a complete body of information, and are largely self-supporting rather than supplementary in the teaching-learning process. (See also INSTRUCTIONAL AIDS.) (D & T Comm)

INTERCOMMUNICATION SYSTEM Usually a two-way "intercom" audio network which permits "talk-back" between the teacher and student in an electronic learning laboratory or remote classrooms on a closed TV circuit; also audio connection between a TV or radio director and crew members. (D & T Comm)

LANGUAGE LABORATORY A term currently used to describe a room equipped for language instruction in which tape recorders, projectors, record players, and other devices are singly or in combination, used. (See ELECTRONIC LEARNING LABORATORY.) (Brown)

MAGNETIC TAPE An acetate or plastic ribbon coated on one surface with tiny oxide particles. The ¼" width tape is ordinarily employed for magnetically recording audio for subsequent reproduction. Special tapes of greater width are used for magnetic storage of data in computers. The most recent development is the 2" width used in video tape recording the entire television program, including the audio, video, and synchronizing and control signals. (Lewis)

MASTER TAPE The tape recording from which duplicates are made. Frequently valuable "master tapes" are copied on metal disc records to insure the recorded material against loss due to fire or accidental exposure of the master tape to strong magnetic fields. (Cross)

MICROPHONE A device employed to pick up sound frequencies and to convert them to electrical variations for transmission on electrical cables. Microphones are available in a variety of designs and pickup or directional patterns. Accessories permit the use of booms, stands, and clips as supporting and manipulating arrangements. (Lewis)

MODEL The voice or voices, preferably of native speakers, which are recorded as a guide for student practice. Also the utterances or basic material of each lesson which appear in dialogue form, narrative form, or in isolation and are used as models for the students. (USOE)

MONITORING In electronic learning labs, listening to the sound signal as it is being recorded or played back. A separate playback head on some recorders permits listening to the tape as the recording is made. Also listening to students through the intercom during listen-speak practices or during record playback of student practice responses.

PATTERN DRILL Exercise with basic or model utterances in which several small and consistent changes in sound, form, order, and vocabulary are made repeatedly in order to gain control over the specific grammatical (or other) structure involved. (USOE)

PLAYBACK Expression used to denote reproduction of the sound previously recorded. (USOE)

PROGRAM A sequence of carefully constructed items leading the student to mastery of a subject with minimal error. The distinguishing characteristic of programed materials is the testing procedure to which they are subjected. Empirical evidence of the effectiveness of each teaching sequence is obtainable from the performance records of students. (See programing, LINEAR and INTRINSIC.) (Markle)

PROGRAMED INSTRUCTION The utilization of programed materials in achieving educational objectives. Synonymous with "auto-instruction, automated teaching," etc. (Markle)

PROGRAMER (COMPUTER) Individual who prepares instruction sequences and who develops the step-by-step operations which are to be performed by the computer in order to solve a problem. (IBM)

PROGRAMING, INTRINSIC A programing technique developed by Norman Crowder, characterized by relatively lengthy items, multiple-choice responses, and consistent use of branching. If, after reading the information section of each item, the student selects the correct response to the question based on the material, he is sent to an item presenting new information. If he selects an incorrect alternative, he is sent to an item which provides information as to why his choice was incorrect. To the extent that the programer has correctly predicted the possible responses that the student population will make, the progress taken by each student is under the control of his own responses, and will differ for students of differing abilities. (Markle)

PROGRAMING, LINEAR A technique of programing developed by B. F Skinner. Set sequences of items present information in small units and require a response from the student at each step. The steps are so designed that errors will be minimal for even the slower students in the target population. Every student does each item in the program, his progress differing only in the rate at which he proceeds through the sequence. Constructed responses are demanded of the student most of the time. (Markle)

RECORDER, TAPE A tape unit, sometimes called a recorder/reproducer, which can record and play back. It contains recording and playback amplifiers and heads. The heads may be full-track, half-track, dual-track, or quarter-track. (USOE)

REMOTE CONTROL Mechanical and/or electrical installation which make possible the control, operation, and adjustment of such devices as projectors, cameras, tape recorders, electronic learning labs, audio and video systems in adjacent or remote areas by means of special switches and electrical relays. (D & T Comm)

SELF-MONITORING SYSTEM In a language lab, equipment which permits the student to hear his own voice performance either simultaneously through "activated" headphones or delayed, by means of playing back his recording. (USOE)

SOLENOID Electromagnet which forces a piston to move by magnetic action when a current is introduced in order to activate a mechanical operation in a piece of electronic equipment. (D & T Comm)

SOLID-STATE ELECTRONICS Term used to describe a special type of small electronic component, such as transistors, which have no lighted or heated filaments and which can be used instead of vacuum tubes in most electronic circuits. (USOE)

STUDENT POSITION OR STATION Desk, table, or booth where student equipment is located for receiving a program and reacting to it. (D & T Comm)

SYSTEMS APPROACH An integrated, programed complex of instructional media, machinery and personnel whose components are structured as a single unit with a schedule of time and sequential phasing. (Its purpose is to insure that the components of the organic whole will be available with the proper characteristics and at the proper time, to contribute to the total system, and in so doing, to fulfill the goals which have been established.) (D & T Comm)

SYSTEMS DESIGN (IN EDUCATION) Provides a conceptual framework for planning, orderly consideration of functions and resources, including personnel and technical facilities such as television, the kinds and amount of resources needed, and a phased and ordered sequence of events leading to the accomplishment of specified and operationally defined achievements. A systems approach should provide a way of checking on the relation of performances of all components to factors of economy and should reveal any inadequacies of the several components, including the faults of timing and consequently of the entire system. (Carpenter)

SYSTEMS ENGINEER Studies problem in industry, science, business, and government, and then organizes electronic data processing techniques and machine systems to solve them. He works at the source and with management in the organization concerned. (IBM)

TAPE CARTRIDGE Magazine or hard plastic case containing a reel, or two, of tape which is placed on a recorder without threading. Reel-to-reel cartridges allow the tape movement to be controlled in either direction. Endless-loop or continuous-loop cartridges can continue playing indefinitely but do not permit rewinding at will. (USOE)

TAPE MAGAZINE See MAGAZINE, TAPE

TAPE RECORDER See RECORDER, TAPE

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TELEMATION A complex of existing devices combined into one rather intricate instrument which includes a wall-sized panel of three (or more) translucent screens; a tape recorder, movie projector, three transparency projectors and one opaque projector--all situated behind the screens; an instructor's lectern; and pushbutton control panel for operating the equipment. Can be programed on a punched tape for automatic presentation. (See also TELEPROMPTER.) (D & T Comm)

TELEPROMPTER A mechanical "cue" feeder to television actors (or teachers) has been broadened and developed into one of the effective mechanical aids available to speakers (or lecturers).

Large typed words, eight times the size of regular typewriter type, unroll through a compact unit in front of the speaker. The typed words, on a long roll of paper, enter the speaker's field of vision at a rate of speed controlled by either the speaker or an assistant.

It is possible to go back in the speech or go forward at an accelerated rate if the occasion demands.

Using more than one unit is synchronization, the speaker can apparently look the audience in the eye as his eyes travel back and forth from the multiple teleprompters placed to the left and right of the lectern.

By incorporating a set of solenoid switches in one of the teleprompters and placing thin strips of adhesive-backed aluminum foil on the roll of teleprompter paper at the cue words, to activate the switches, recorders, projectors, and room lights can be turned off and on in synchronization with the speaker's delivery. (See also TELEMATION.) (ANA)